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DEPARTMENT OF FISH AND GAME

FEDERAL AID IN FISH RESTORATION
1996 Job Performance Report
Program F-71-R-21

REGIONAL FISHERIES MANAGEMENT INVESTIGATION
PANHANDLE REGION (Subprojects I -A, II-A, 111 A, IV A)

PROJECT I.	SURVEYS AND INVENTORIES
Job a.	Panhandle Region Mountain. Lakes Investigations
Job b.	Panhandle Region Lowland Lakes Investigations
Job c.	Panhandle Region Rivers and Streams Investigations
PROJECT II.	TECHNICAL GUIDANCE
PROJECT III.	HABITAT MANAGEMENT
PROJECT IV.	POPULATION MANAGEMENT

BY

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1996 ANNUAL PERFORMANCE REPORT

State of:	Idaho	Program:	Fisheries Management F-71-R-21
Project:	I-Surveys and Inventories	Subproject:	I-A Panhandle Region
Job No.:	a	Title:	Mountain Lakes Investigations

Contract Period: July 1, 1996 to June 30, 1997

ABSTRACT

No mountain lakes were surveyed in the Panhandle Region during this contract period.

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1996 ANNUAL PERFORMANCE REPORT

State of Idaho | Program: Fisheries Management F-71-R-21

Project: I-Surveys and Inventories | Subproject: I-A Panhandle Region

Job No.: b | Title: Lowland Lake Investigations

Contract Period: July 1, 1996 to June 30, 1997

ABSTRACT

We used a midwater trawl to estimate the kokanee population in Coeur d'Alene Lake in July. Age-3 kokanee density was 147 fish/ha in Coeur d'Alene Lake and density of all age classes was 603 fish/ha. We estimated a potential egg deposition of 358 million eggs in Coeur d'Alene Lake. The mean size of spawning kokanee was 264 mm and 275 mm for males and females, respectively, which is a slight increase from recent years. We did not estimate the Spirit Lake kokanee population because we were unable to launch the midwater trawl boat due to low lake levels.

We counted 84 chinook redds in the Coeur d'Alene River drainage and 71 in the St. Joe River, for a total of 155. All accessible redds in the St. Joe River were destroyed, whereas redds in the Coeur d'Alene drainage were left undisturbed to provide natural production. Forty-five adult chinook salmon were captured in a weir at Wolf Lodge Creek and a total of 96,188 green eggs were taken for hatchery incubation and rearing. A total of 39,700 age-0 chinook salmon were stocked in Wolf Lodge Bay on June 25, 1996.

Hydroacoustic surveys were conducted to estimate lake trout populations in Priest Lake and Upper Priest Lake. The estimate of all fish greater than 330 mm in Priest Lake was 22,595. Because lake trout are often closely associated with the bottom, hydroacoustic equipment may not detect all fish and this is likely an underestimate. We did not identify sufficient targets in Upper Priest Lake to develop a total population estimate.

We used hollow cement chimney blocks to provide spawning structure for channel catfish in Cocolalla Lake and a thermograph to determine whether temperatures were sufficiently high to allow successful spawning. We found no evidence of use of the structures, and data from the thermograph indicated the water temperature was probably too low for successful spawning and sufficient age-0 growth.

A standard lake survey on Bonner Lake indicated of the three species collected (rainbow trout, largemouth bass, and pumpkinseeds) only 34% of the biomass was rainbow trout. Largemouth bass comprised the majority of the biomass at 54%. Most of the largemouth bass collected were small (<305 mm), and only 9 of 273 largemouth bass collected were of harvestable size. Largemouth bass growth was slow, and fish did not achieve 305 mm until around age-7. Suitable trout habitat (dissolved oxygen >5 mg/L, temperature <21°C) was restricted to the metalimnion (19% of total lake volume) in mid-July based on temperature and DO profiles.

A standard Lake survey on Bloom Lake resulted in a sample biomass of 65% brook trout and 35%

pumpkinseeds. The modal size increment of brook trout was 230-240 mm, and no fish collected in the sample exceeded 290 mm. The oldest fish collected in the sample were age-3. Relative weight declined with length. Based on temperature and dissolved oxygen measurements taken July 29, temperatures exceeded 20°C throughout most of the water column, and only 11,400 m^3 (5.7% of the total volume) was suitable trout habitat.

Standard Lake surveys on Anderson Lake and Blue Lake indicated high Proportional Stock Density and Relative Stock Density -Preferred values in both lakes, suggesting a large proportion of preferred size fish in the population. Few largemouth bass less than 300 mm were collected in Anderson Lake and Blue Lake in comparison to Bonner Lake. Based on largemouth bass collected with gillnets, trapnet, and by electrofishing in May and June, many of the age-1 to age-5 year classes were poorly represented or entirely missing, indicating irregular recruitment. Based on scale analysis in 1996, largemouth bass reach 300 mm at around five years of age. This is about one year slower than when Blue Lake and Anderson Lake were surveyed in 1989 and 1990.

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OBJECTIVES

1. Estimate angling effort and total harvest of kokanee, chinook salmon, and warmwater species on Coeur d'Alene Lake and the St. Joe lateral lakes.
2. Summarize Conservation Officer Creel Survey reports to provide additional information on regional lowland lakes.
3. Determine stock status of kokanee in Coeur d'Alene Lake.
4. Eliminate all chinook redds in the St. Joe River and leave a total of 100 redds in the Coeur d'Alene River system for natural production.
5. Trap and artificially spawn adult chinook in Wolf Lodge Creek for hatchery incubation and rearing.
6. Determine stock status of kokanee in Spirit Lake.
7. Determine stock status of lake trout in Priest Lake.
8. Determine stock status of lake trout in Upper Priest Lake
9. Evaluate the potential for natural reproduction of channel catfish in Cocolalla Lake.
10. Conduct standard lowland lake surveys on Bloom Lake and Bonner Lake to assess the potential for special trout regulations.
11. Conduct standard lowland lake surveys on Anderson Lake and Blue Lake to evaluate largemouth bass special regulations.

METHODS

Angler Creel Surveys

Coeur d'Alene Lake

We conducted a creel survey on Coeur d'Alene Lake from July 1, 1995 through June 30, 1996. The lake was divided into three sections (Figure 1). Chatcolet, Benewah and Round lakes were included as separate bodies of water. The sampling period was divided into months. Fifty percent of the weekend days and 20% of the weekdays were sampled. All sample days were randomly selected. Boat and bank angler counts were conducted twice per sampling day by airplane. Anglers were interviewed on the lake or at access points (boat ramps or marinas). During angler interviews, we recorded the number of anglers in the group, total hours fished, hours fished for each species, preferred fish species, and how many of each fish species were caught and either released or kept.

Data were summarized using the IDFG creel survey analysis methods (McArthur 1993) by section or lake by month and by day type either weekend or weekday using. Point estimates were calculated for angler effort, catch rates and fish caught and harvested.

Officer Creel Survey

In an ongoing program, Conservation Officers recorded impromptu creel survey information collected from various regional waters. These angler contacts were not part of any structured creel survey, but rather were associated with random license checks and other contacts with the fishing public.

Fish Population Characteristics

Coeur d'Alene Lake

Kokanee Population Estimate-Midwater trawling, as described by Bowler et. al. (1979), Rieman and Myers (1990), and Rieman (1992), was used to estimate the kokanee *Oncorhynchus nerka* population in Coeur d'Alene Lake. Unlike previous years, we used vertical spreader bars to keep the mouth of the trawl open and improve capture efficiency in 1996. Echograms produced during the calibration effort indicated the planer boards were not consistently keeping the net open. To evaluate the utility of the spreader bars, at the beginning of the effort on Coeur d'Alene Lake, we trawled the same five transects both with and without spreader bars. A paired-t test indicated no significant difference in the methods for any age group (Appendix A), however, because spreader bars were considered easier to manipulate, they were left in place for the remaining transects.

Twenty-four transects were trawled in 1995 during the dark phase of the moon from August 12 to August 14. Trawl transects were selected using a stratified random sample design and were in identical locations (as near as possible) to those used in previous years (Figure 2).

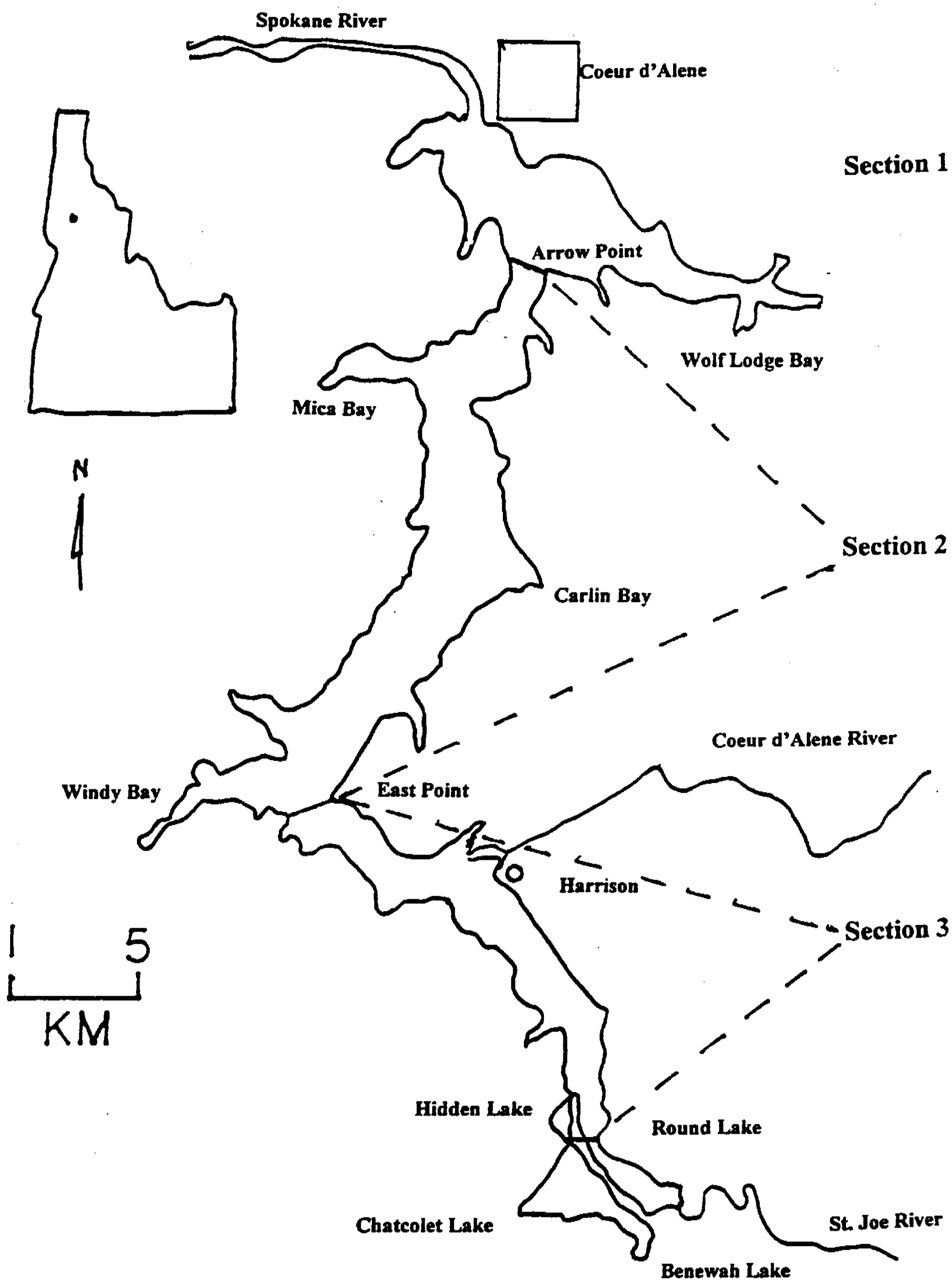

Figure 1. Location of the three sections and St. Joe lateral lakes surveyed during the Coeur d'Alene Lake, Idaho, creel survey.

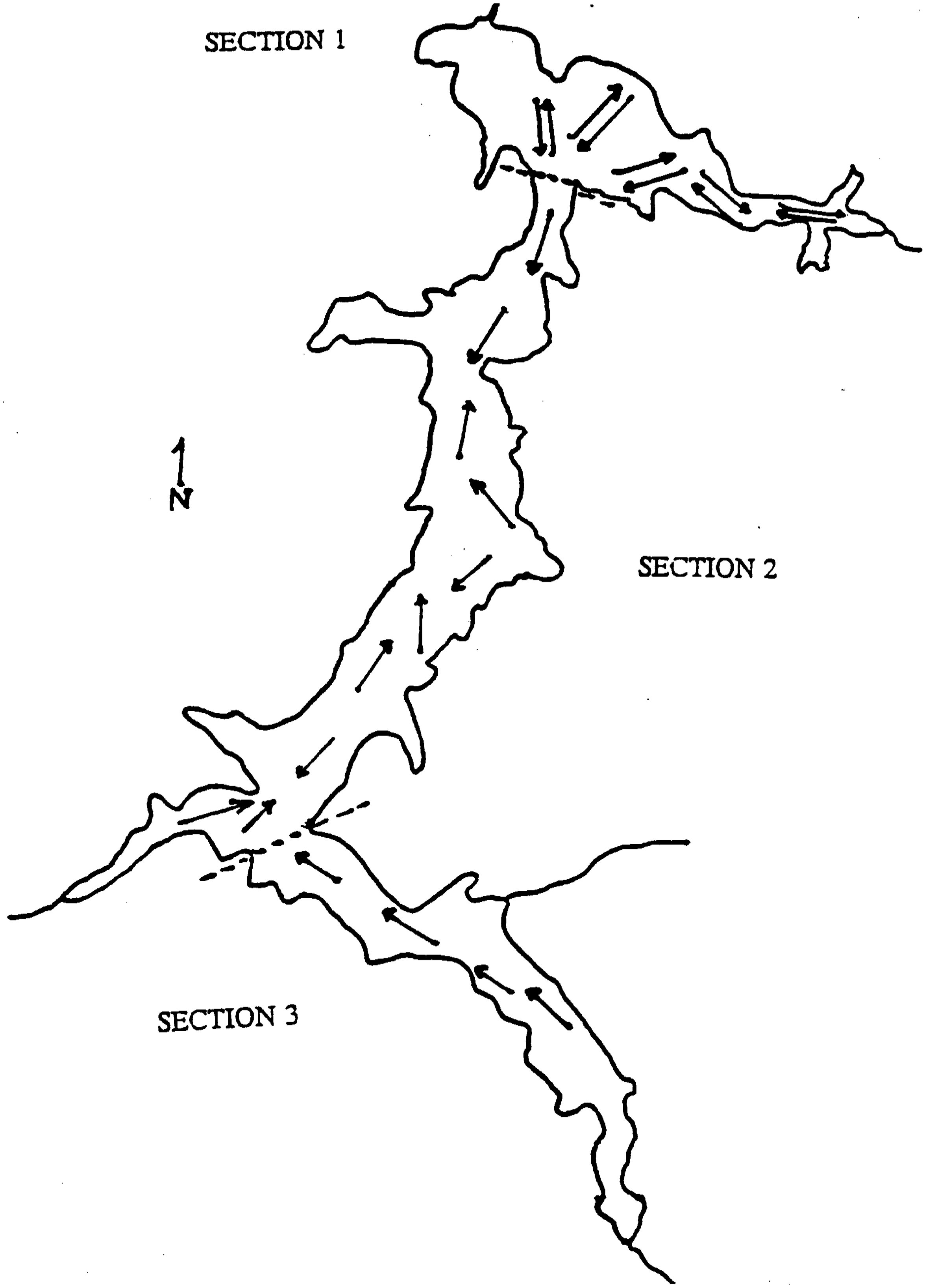

Figure 2. Location of the three sections and trawl transects used to estimate the kokanee population in coeur d'Alene Lake, Idaho

Total lengths (TL) of male and female kokanee spawners were recorded from fish collected with gillnets set along the Coeur d'Alene Lake shoreline near Blue Creek Bay on December 2, 1996. Potential egg deposition was estimated as the number of female kokanee spawners (half the age 3+ population based on midwater trawling) multiplied by the average number of eggs produced per female. The average number of eggs produced per female kokanee was calculated using the following length to fecundity regression:

$$Y = 3.98x - 544$$

Where: x = mean length of female kokanee spawners (mm)
Y = mean number of eggs per female

Chinook Salmon Abundance-As in previous years, we utilized a combination of hatchery reared and naturally produced juvenile chinook salmon to propagate the chinook salmon population in Coeur d'Alene Lake. Department personnel used a helicopter to conduct chinook salmon *O. tshawytscha* redd surveys in the Coeur d'Alene River, North Fork Coeur d'Alene River, South Fork Coeur d'Alene River, Little North Fork Coeur d'Alene River and St. Joe River on October 7, 1996. Redds were enumerated, and locations were identified on maps for relocation from the ground.

To prevent chinook salmon from establishing a reproducing population in the St. Joe River, we destroyed all identifiable redds using a high pressure hydraulic pump and fire hose. We estimated the natural chinook salmon production using redd counts and estimates of 4,000 eggs per redd and a mean egg-to-smolt survival of 10%. Based on these figures, we estimated that a total of 100 redds were needed to produce the target of 40,000 naturally produced smolts.

As in previous years, we used a weir on Wolf Lodge Creek to collect migrating adult chinook salmon for egg collection. The weir was installed beneath the interstate bridge on September 3 and removed October 18.

Spirit Lake

Kokanee Abundance-We were unable to develop kokanee population estimates on Spirit Lake. The low water conditions in Spirit Lake in July and August precluded the launching and use of the midwater trawl vessel.

Priest Lake and Upper Priest Lake

Lake Trout Hydroacoustic Surveys-As in 1995, hydroacoustic surveys were conducted on Priest and Upper Priest lakes in 1995 in an attempt to quantify lake trout abundance. A Simrad EY500 split-beam scientific echosounder with a 120 kHz transducer was used to document the abundance and distribution of all fish in Priest and Upper Priest lakes. Echograms collected in the field were later analyzed using Simrad EP500 software version 5.0. Boat speed use on Priest Lake was 1.9 to 2.1 m/s. Boat speed on Upper Priest Lake was slower at 1.7 to 1.9 m/s, due to shallower water depths. The echosounder was set to ping at 0.7 s intervals, with a pulse width of 0.3 milliseconds. Horner et al. (in press[a]) contains a complete list of echosounder settings used for the surveys and individual transect echograms. The echosounder was calibrated at the beginning of the surveys using a 23 mm copper calibration sphere with a target strength of about -40.4 decibels (dB), depending on temperature. We used a model developed by Love (1971) to convert signal strength (dB) to target size (Appendix B) and thereby estimate the size of fish identified in the hydroacoustic surveys.

A series of 15 transects for Priest Lake and ten transects for Upper Priest Lake (Figure 3) were selected from predetermined Global Positioning System (GPS) points (Appendix C). The transects covered the entire length of both lakes. The surveys were conducted after dark and before dawn on May 22 and May 23, 1996 for Priest Lake and Upper Priest Lake, respectively. The transects were associated with landmarks on shore, beginning and ending at the 10 m depth contour. Maximum target depth default was set at 100 m. The boat was piloted by visual landmarks, compass headings, and GPS locations.

The Priest Lake transects were combined for the purpose of analysis. Fish densities (fish/ha), by dB frequency (size class), were taken from the Simrad EP500 software analysis and extrapolated to total lake area. Confidence intervals for abundance estimates were calculated at both the 90% and 95 % level. We estimated the number of fish in four separate size ranges, as well as the total lake population. The first interval was fish with target strengths of -50 to less than -35 dB. These fish were estimated to be from about 5 mm to 330 mm, and several species are probably represented. The second interval was comprised of fish with target strengths from -35 dB to less than -32 dB or from 330 mm to 457 mm. Based on length, these fish are likely predominately lake trout and represent the size-class of fish that first appear in the harvest. The third interval was for fish with target strengths of greater than -32 dB to less than -29 dB, or from 457 to 660 mm. This group represents the most frequently harvested size-class of lake trout and is an estimate of fish nearing the protective slot limit. The final interval is of fish greater than -29 dB (660 mm and larger) and are fish within or above the protective slot limit.

Lake Trout Tagging-Sixty-seven additional lake trout were tagged and released in 1996 as part of an ongoing tagging effort to quantify angler exploitation and help define the population dynamics of lake trout in Priest Lake. Lake trout were captured by hook and line and a plastic floy tag was placed in the dorsal musculature beneath the dorsal fin. All fish were caught and tagged by Randy Phelps, a volunteer angler. Catch location, date, fish length and weight, and any comments regarding the health or release of the fish were recorded at the time of tagging along with the tag number. Fish were released back to the same water from where they were captured. Four of the 67 tags were reward tags (blue), and the remainder were non-reward tags (yellow).

As in 1995, some lake trout that were captured at greater depths (>35 m) and did not have the opportunity to void their swim bladder before reaching the surface, were assisted in their return to depth by inserting a small gauge hypodermic needle into the fish at a point midway between the anal vent and pelvic fins and midway between the ventral line and the bottom of the belly into the swim bladder. The needle was inserted at a slight angle forward until air was heard escaping and the swim bladder was sufficiently evacuated for the fish is able swim down on its own. We recorded the number of all tagged that underwent the deflation procedure to evaluate the survival of treated fish. Four of the 67 fish tagged in 1996 underwent this procedure.

Cocolalla Lake

Channel Catfish Spawning Potential-We evaluated the potential for natural reproduction of channel

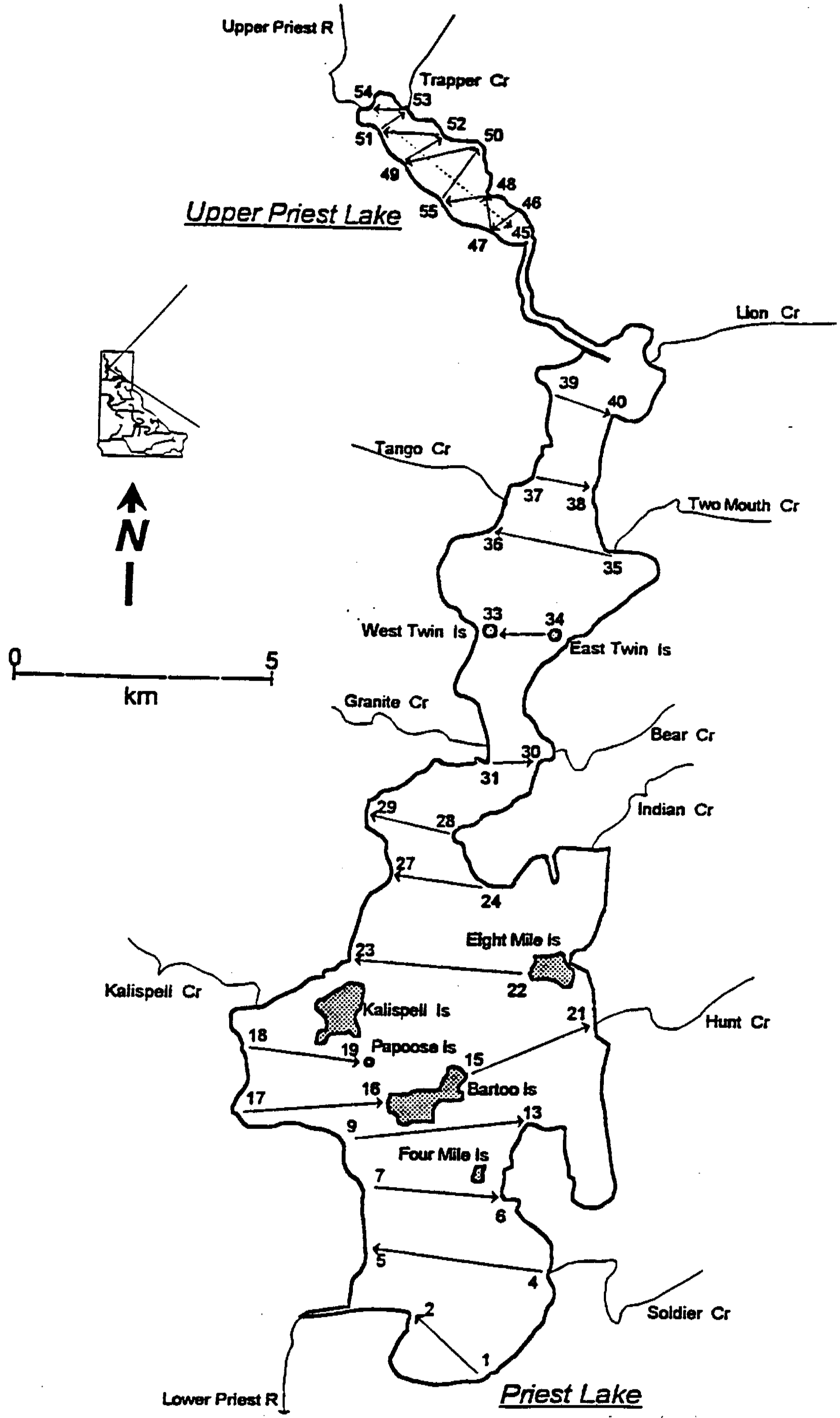

Figure 3. Hydroacoustic transect locations and direction used to estimate lake trout population in Priest Lake and Upper Priest Lake, Idaho.

catfish *Ictalurus punctatus* in Cocolalla Lake. Hollow cement block structures were placed on the bottom at a depth of about 1.5 m (Appendix D). A thermograph was placed amongst the structures from July 2 to September 18 to record available thermal units during typical channel catfish spawning period. On two occasions in July and August, we inspected the structures with snorkelling equipment for the presence of channel catfish.

Fish Kill Investigation-A fish kill was reported in Cocolalla Lake in early July. On July 3, we used a boat to collect dead fish from the lake, recording individual length and total number for each species. Dissolved oxygen (DO) levels were measured at seven sites around the lake (Appendix E). On July 8, the entire length of the lake shoreline and the area near the outlet was again searched for dead fish. Two gill-nets (one floating, one sinking; Appendix E) were set overnight to collect live specimens for laboratory analysis.

Standard Lowland Lake Surveys

Bonner Lake and Bloom Lake

We conducted standard lowland lake surveys on Bonner Lake and Bloom Lake using procedures outlined in the standard lowland lakes survey manual. In addition to collecting information for the standard survey, our secondary objective with Bonner Lake and Bloom Lake was to evaluate the potential to improve these fisheries with special trout regulations. Bonner Lake fish populations were sampled on June 4 with electrofishing equipment and June 24, with gillnets and trapnets. Limnological sampling was conducted on July 18. Bloom Lake fish populations were sampled on June 5 with electrofishing equipment and on June 25 with gillnets and trapnets. Limnological sampling was conducted on July 29.

Anderson Lake and Blue Lake

We conducted standard lowland lake surveys on Anderson Lake and Blue Lake with a secondary objective of evaluating the special largemouth bass regulations which apply to these two Coeur d'Alene River lateral lakes. Fish populations in Anderson Lake were sampled on June 6 with gillnets and trapnets, and on June 26 with electrofishing equipment. Limnological sampling was conducted on July 11. Fish populations in Blue Lake were sampled on May 30 with gillnets and trapnets, and on June 26 with electrofishing equipment. Limnological sampling was conducted on July 11 and July 29.

RESULTS

Angler Creel Surveys

Coeur d'Alene Lake

Anglers fished an estimated 250,371 h on Coeur d'Alene Lake from July 1, 1995 to June 30, 1996 (Table 1). Sixty-six percent of the total fishing effort was directed toward chinook salmon and 20% toward kokanee, (Table 2). Ten percent of the total effort was directed toward northern pike, 3.5 % toward largemouth bass, and only 0.05% of the effort was directed toward westslope cutthroat trout (Table 2).

Anglers caught an estimated 4,803 chinook salmon and harvested 3,313 from Coeur d'Alene Lake for catch rates of 34 and 49 h/fish, respectively (Table 3; Appendix F). Kokanee comprised 91% of the total fish caught and 95% of the total fish harvested from Coeur d'Alene Lake. Anglers harvested 21% of the largemouth bass and 69% of the northern pike caught. Anglers caught only 51 westslope cutthroat trout and harvested 4.

Total fishing effort was nearly split between weekend and weekdays, 52% and 48%, respectively. Section 1 had the highest total fishing effort with 57%, followed by Section 3 with 31% and Section 2 with 17% (Table 1).

Chatcolet, Benewah and Round Lakes

Estimated fishing effort on Chatcolet, Benewah and Round lakes was 14,259 h, 9,180 h and 1,200 h, respectively (Table 4). Fishing effort during the weekends comprised 67 %, 61% and 48 % of the estimated total fishing effort in Chatcolet, Benewah and Round lakes, respectively. Boat anglers in Chatcolet, Benewah and Round lakes comprised 58 %, 69 % and 100 % of the estimated total fishing effort, respectively.

Yellow perch were the most abundant fish species caught in Chatcolet Lake followed by largemouth bass and black crappie (Table 5; Appendix G). In Benewah Lake, black crappie were the most abundant fish caught followed by yellow perch and largemouth bass (Appendix H). We estimated only 18 fish were caught in Round Lake (Table 5; Appendix I).

Officer Creel Survey

Conservation officers collected creel survey information from 2,358 residents and 1,001 non-residents, for a total of 3,377 anglers on 45 regional lakes and sloughs in 1996. In total, 11,926 angler hours were represented over 281 days in the lakes portion of the officer creel survey (Appendix J).

Table 1. Summary of fishing effort by section, month, day type, and type of boat angler either chinook/kokanee (Ck/kok), warmwater (WW), or bank angler for Coeur d'Alene Lake, Idaho, July 1, 1995 to June 30, 1996.

		Section 1			Section 2			Section 3			Total			
Month	Day type	Ck/kok	WW	Bank	Ck/kok	WW	Bank	Ck/kok	WW	Bank	Ck/kok	WW	Bank	TOTAL
July	Weekend	4,356	1,089	182	3,267	472	182	4,719	1,416	182	12,342	2,977	546	15,865
	Weekday	5,280	660	0	1,980	396	0	5,280	528	0	12,540	1,584	0	14,124
	Total	9,636	1,749	182	5,247	868	182	9,999	1,944	182	24,882	4,561	546	29,989
August	Weekend	10,388	725	0	3,624	145	0	10,630	145	0	24,642	1,015	0	25,657
	Weekday	13,197	695	0	4,168	139	0	11,808	647	0	29,173	1,481	0	30,354
	Total	23,585	1,420	0	7,792	284	0	22,438	492	0	53,815	2,196	0	56,011
September	Weekend	6,968	1,152	0	2,412	429	0	4,824	389	0	14,204	1,970	0	16,174
	Weekday	5,360	1,206	0	2,144	295	0	3,752	670	0	11,256	2,171	0	13,427
	Total	12,328	2,358	0	4,556	724	0	8,576	1,059	0	25,460	4,141	0	29,601
October	Weekend	3,220	920	115	1,150	184	0	460	230	0	4,830	1,334	115	6,279
	Weekday	2,898	242	0	483	58	0	483	242	0	3,864	542	0	4,406
	Total	6,118	1,162	115	1,633	242	0	943	472	0	8,694	1,876	115	10,685
November	Weekend	3,420	86	3,591	855	0	0	0	17	0	4,275	103	3,591	7,969
	Weekday	2,394	100	0	798	0	0	0	40	0	3,192	140	0	3,332
	Total	5,814	186	3,591	1,653	0	0	0	57	0	7,467	243	3,591	11,301
December	Weekend	3,102	0	310	414	0	0	0	0	0	3,516	310	0	3,826
	Weekday	3,008	0	0	376	0	0	0	0	0	3,384	0	0	3,384
	Total	6,110	0	310	790	0	0	0	0	0	6,900	0	310	7,210
January	Weekend	497	0	0	0	0	0	0	50	0	497	50	0	547
	Weekday	809	0	0	0	0	0	0	0	0	809	0	0	809

Table 1. Continued.

		Section 1			Section 2			Section 3			Total			
Month	Day type	Ck/kok	WW	Bank	Ck/kok	WW	Bank	Ck/kok	WW	Bank	Ck/kok	WW	Bank	TOTAL
	Total	1,306	0	0	0	0	0	0	50	0	1,306	50	0	1,356
February	Weekend	371	37	0	0	0	0	0	0	0	371	37	0	408
	Weekday	0	0	0	0	0	0	0	0	0	0	0	0	0
	Total	371	37	0	0	0	0	0	0	0	371	37	0	408
March	Weekend	2,832	944	1,770	0	24	0	236	71	0	3,068	1,039	1,770	5,877
	Weekday	2,974	496	1,982	0	142	0	248	0	0	3,222	638	1,982	5,824
	Total	5,806	1,440	3,752	0	148	0	484	71	0	6,290	1,677	3,752	11,701
April	Weekend	3,480	2,030	2,436	2,320	1,114	0	928	522	580	6,728	3,666	3,016	13,410
	Weekday	2,517	881	2,202	0	989	319	1,276	638	638	3,793	2,508	3,159	9,460
	Total	5,997	2,911	4,638	2,320	2,103	319	2,204	1,160	1,218	10,521	6,174	3,175	22,871
May	Weekend	6,955	797	1,014	1,739	580	145	869	942	580	9,563	2,319	1,739	1,3621
	Weekday	9,918	1,240	1,417	1,417	354	354	1,417	354	1,412	12,752	1,948	3,183	1,7883
	Total	16,873	2,037	2,431	3,156	934	499	2,286	1,296	1,992	22,315	4,267	4,922	31,504
June	Weekend	5,440	2,142	2,040	2,380	1,581	170	4,420	1,020	510	12,240	4,743	2,720	19,703
	Weekday	8,160	884	1,020	4,080	952	680	1,360	238	340	13,600	2,074	2,040	17,714
	Total	13,600	3,026	3,060	6,460	2,533	850	5,780	1,258	850	25,8406	6,817	4,760	37,417
Total	Weekend	51,029	9,922	11,458	18,161	4,529	497	27,086	4,802	1,852	96,276	19,253	13,807	129,336
	Weekday	56,515	6,404	6,621	15,446	3,325	1,353	25,624	3,357	2,390	97,585	13,086	10,364	121,035
	Total	107,544	16,326	18,079	33,607	7,854	1,850	52,710	8,159	4,242	193,861	32,3239	24,171	250,371

Table 2. Estimated effort expended for each fish species based on percentage of total hours calculated from angler interviews where anglers specified a target species in Coeur d'Alene Lake, Idaho, July 1, 1995 to June 30, 1996.

	Section 1		Section 2		Section3		Total	
Species	Percent	Hours	Percent	Hours	Percent	Hours	Percent	Hours
Chinook	68.3	96,947	75.0	32,470	52.6	34,248	66	163,665
Kokanee	11.4	16,139	17.0	7,360	40.1	26,110	20	49,609
Largemouth bass	2.9	4,107	0.7	303	6.6	4,297	3.5	8,707
Smallmouth bass	0.4	628	0	0	0	0	0.3	628
Northern pike	17.0	24,010	1.3	563	0.7	456	10	25,290
Trout	0.08	119	0.02	9	0	0	.05	128

Table 3. Summary of creel survey estimates for fishing effort and fish harvested, released and caught, by species for Coeur d'Alene Lake, Idaho, July 1, 1995 to June 30, 1996.

	Section 1			Section 2			Section 3			All		
Effort estimate	141,949 hours			43,311 hours			65,111 hours			250,371 hours		
Species	Estimated fish harvested	Estimated fish released	Estimated total fish caught	Estimated fish harvested	Estimated fish released	Estimated total fish caught	Estimated fish harvested	Estimated fish released	Estimated total fish caught	Estimated fish harvested	Estimated fish released	Estimated total fish caught
CK	2,597	1,087	3,684	371	123	494	345	280	625	3,313	1,490	4,803
KOK	41,601	2,094	43,695	15,409	0	15,409	36,371	131	36,502	93,381	2,225	95,606
LMB	120	858	978	0	17	17	130	87	217	250	962	1,212
SMB	0	240	240	0	0	0	0	0	0	0	240	240
WCT	4	18	22	0	17	17	0	12	12	4	47	51
RBT	0	0	0	0	0	0	0	0	0	0	0	0
PIKE	500	152	652	23	46	69	0	32	32	523	230	753
BC	27	161	188	0	17	17	0	0	0	27	178	205
CC	0	0	0	0	0	0	0	0	0	0	0	0
BH	625	65	690	0	0	0	0	0	0	625	65	690
PE	166	743	909	0	0	0	0	0	0	166	743	909
OTH	139	52	191	22	0	22	7	7	14	168	59	227
TOT	45,779	5,470	51,249	15,825	220	16,045	36,853	549	37,402	98,457	6,239	104,696

CK-Chinook Salmon, KOK-Kokanee, LMB-Largemouth Bass, SMB-Smallmouth Bass, WCT-Westslope Cutthroat Trout, RBT-Rainbow Trout, PIKE-Northern Pike, BC-Black Crappie, CC-Channel Catfish, BH-Brown Bullhead, PE-Yellow Perch, OTH-Other fish species that include pumpkinseed, squawfish, suckers, tench.

Table 4. **Summary of fishing effort by month, day type, and type of angler, either boat or bank angler, for Chatcolet, Benewah and Round lakes, Idaho, July 1, 1995 to June 30, 1996.**

		Chatcolet Lake			Benewah Lake			Round Lake		
Month	Day type	Boat	Bank	Total	Boat	Bank	Total	Boat	Bank	Total
July	Weekend	1	545	1	490	182	672	73	0	73
	Weekday	1.	0	1.	429	0	429	0	0	0
	Total	2.	545	2.	919	182	1.	73	0	73
August	Weekend	507	121	628	507	121	628	24	0	24
	Weekday	452	0	452	452	70	492	0	0	0
	Total	959	121	1.	959	191	1.	24	0	24
September	Weekend	911	0	911	308	134	452	0	0	0
	Weekday	536	0	536	54	0	54	0	0	0
	Total	1.	0	1.	362	134	506	0	0	0
October	Weekend	334	0	334	104	0	104	0	0	0
	Weekday	128	0	128	121	0	121	0	0	0
	Total	462	0	462	225	0	225	0	0	0
November	Weekend	0	0	0	0	0	0	0	0	0
	Weekday	40	0	40	0	0	0	0	0	0
	Total	40	0	40	0	0	0	0	0	0
December	Weekend	0	0	0	0	0	0	0	0	0
	Weekday	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
January	Weekend	0	0	0	0	0	0	0	0	0
	Weekday	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
February	Weekend	0	0	0	0	0	0	0	0	0
	Weekday	0	0	0	0	0	0	0	0	0
	Total	0	0	0	0	0	0	0	0	0
March	Weekend	24	0	24	24	24	48	0	0	0
	Weekday	0	0	0	0	0	0	0	0	0
	Total	24	0	24	24	24	48	0	0	0
April	Weekend	487	116	603	406	580	986	58	0	58

Table 4. Continued.

		Chatcolet Lake			Benewah Lake			Round Lake		
Month	Day type	Boat	Bank	Total	Boat	Bank	Total	Boat	Bank	Total
	Weekday	96	0	96	96	319	415	96	0	96
	Total	583	116	699	502	899	1.	154	0	154
May	Weekend	435	290	725	435	290	725	73	0	73
	Weekday	354	354	708	708	708	1.	531	0	531
	Total	789	644	1	1.	998	2.	604	0	604
June	Weekend	2	2.	4	1.	1.	2.	442	0	442
	Weekday	680	680	1.	238	340	578	0	0	0
	Total	3	3.	6	1.	1.	2.	442	0	442
Total	Weekend	6	3	9.	3.	2.	5.	573	0	573
	Weekday	3	1.	4.	2.	1.	3.	627	0	627
	Total	9.	4.	14,259	5.	3.	9,180	1.	0	1,200

Table 5. Summary of creel survey estimates for fishing effort and fish harvested, released and caught by species for Chatcolet, Benewah and Round lakes, Idaho, July 1, 1995 to June 30, 1996.

	Chatcolet Lake			Benewah Lake			Round Lake		
Effort estimates	14,259 hours			9,180 hours			1,200 hours		
Species	Estimated fish harvested	Estimated fish released	Estimated total fish caught	Estimated fish harvested	Estimated fish released	Estimated total fish caught	Estimated fish harvested	Estimated fish released	Estimated total fish caught
CK	0	0	0	0	0	0	0	0	0
KOK	1,591	0	1,591	0	0	0	0	0	0
LMB	111	2,030	2,141	104	308	412	12	3	15
SMB	0	0	0	0	0	0	0	0	0
WCT	0	12	12	0	0	0	0	0	0
RBT	0	0	0	8	0	8	0	0	0
PIKE	126	11	137	0	0	0	3	0	3
BC	592	341	933	1,171	746	1,917	0	0	0
CC	12	0	12	0	0	0	0	0	0
BH	0	0	0	0	0	0	0	0	0
PE	1,341	4,135	5,476	0	552	552	0	0	0
OTH	52	571	623	0	245	245	0	0	0
TOT	3,825	7,100	10,925	1,283	1,851	3,134	15	3	18

CK-Chinook Salmon, KOK-Kokanee, LMB-Largemouth Bass, SMB-Smallmouth Bass, WCT-Westslope Cutthroat Trout, RBT-Rainbow Trout, PIKE-Northern Pike, BC-Black Crappie, CC-Channel Catfish, BH-Brown Bullhead, PE-Yellow Perch, OTH-Other fish species that include pumpkinseed, squawfish, suckers, tench.

Fish Population Characteristics

Coeur d'Alene Lake

Kokanee Abundance-Highest kokanee densities were in the northern section of the lake for all year classes except age-1 (Table 6). Population estimates in 1996 indicated low numbers of age-1 and age-2 kokanee in comparison with past years. Survival of the 1994 year-class, or age-0 to age-1 survival (year-class is defined as the year eggs were deposited), was 15%. This is the lowest age-0 to age-1 survival rate yet recorded. The 1995 estimate of the same year-class (as age-0's) was also low in comparison with previous years (2.0 million). The combination of low survival and a small initial year-class has resulted in an age-1 population estimate of less than 10% of the *lowest* estimate since trawling began in 1980 (Table 7).

Based on last the 1995 PED estimate and the 1996 age-0 estimate, egg to fry survival was slightly less than 1%, which is low in comparison to previous years (Table 8). However, the 1995 PED estimate was the highest to date, and therefore, the age-0 kokanee population estimate was within the range of estimates from previous years (range = 0.31 to 6.68%).

We estimated a strong age-class of three-year-old kokanee (1.4 million), consistent with previous years. The density of this year-class, which comprised the kokanee fishery in 1996, was 147 fish/ha, much higher than the 30-50 fish/ha suggested by Rieman and Maiolie (1995). Size of the age-3 fish ranged from 210 mm to 270 mm TL, with a modal length of 230 mm. Size of age-2 fish ranged from 140 to 210 mm, and size of age-1 kokanee ranged from 110 to 150. Kokanee fry collected in the trawl ranged from 30 to 60 mm.

Two-hundred and forty kokanee spawners were collected in gillnets in Beauty Bay. Female mean and modal lengths were 264 mm and 255 mm (TL), respectively (n=78, SD=9.89). The mean and modal lengths of the males were both 275 mm (n=162, SD=8.22). Mean length of spawners was slightly larger than in most years since the late 1970's (Figure 4). Mean fecundity was estimated at 506 eggs per female based on a mean female spawner length of 264 mm. Using an estimated female escapement of 707,000 fish, potential egg deposition was 358 million eggs (Table 8).

Chinook Salmon Abundance-We counted 84 chinook redds in the Coeur d'Alene River drainage and 71 in the St. Joe River, for a total of 155 redds (Table 9). From October 9 through October 11, we destroyed 65 redds in the St. Joe River. Water velocities at some redd locations prevented their destruction. In addition to the redds that we were unable to destroy, we saw 5-10 chinook in the area that may have still been spawning. All 84 redds in the Coeur d'Alene drainage were left undisturbed to provide natural production.

Forty-five adult chinook salmon, 36 females and 9 males, were collected in the Wolf Lodge Creek weir from September 10 to September 30 (Table 10). Of these, 4 were of hatchery origin and 41 were wild. All four hatchery chinook were released in 1992 and were 4 years old at maturity. A total of 96,188 green eggs were taken for hatchery incubation and rearing.

We stocked a total of 39,700 age-0 chinook salmon in the Wolf Lodge Bay area of Coeur d'Alene Lake in 1996 (Table 11). All fish were marked with a right ventral fin clip.

Table 6. Kokanee density (fish/ha) estimates for each age class in each section of Coeur d'Alene Lake, Idaho, August 12-14, 1996.

Section	Age 0	Age 1	Age 2	Age 3	Total
1	1,432	3	54	151	1,641
2	166	2	33	144	348
3	0	6	20	137	163
Whole lake	417	3	36	147	603

Table 7. Estimated abundance (millions) of kokanee made by midwater trawl in Coeur d'Alene Lake, Idaho, from 1977-1996. To follow a particular year class of kokanee, read up one row and right one column.

Sampling	Age Class					
Year	Age 0+	Age 1+	Age 2+	Age 3+	Total	Age 3+/ha
1996	4,019,563	30,278	342,369	1,414,144	5,806,354	147
1995	2,000,000	620,000	2,900,000	2,850,000	8,370,000	296
1994	5,950,000	5,400,000	4,900,000	500,000	12,600,000	52
1993	5,570,000	5,230,000	1,420,000	480,000	12,700,000	50
1992	3,020,000	810,000	510,000	980,000	5,320,000	102
1991	4,860,000	540,000	1,820,000	1,280,000	8,500,000	133
1990	3,000,000	590,000	2,480,000	1,320,000	7,390,000	137
1989	3,040,000	750,000	3,950,000	940,000	8,680,000	98
1988	3,420,000	3,060,000	2,810,000	610,000	10,900,000	63
1987	6,880,000	2,380,000	2,920,000	890,000	13,070,000	93
1986	2,170,000	2,590,000	1,830,000	720,000	7,310,000	75
1985	4,130,000	860,000	1,860,000	2,530,000	9,370,000	263
1984	700,000	1,170,000	1,890,000	800,000	4,560,000	83
1983	1,510,000	1,910,000	2,250,000	810,000	6,480,000	84
1982	4,530,000	2,360,000	1,380,000	930,000	9,200,000	97
1981	2,430,000	1,750,000	1,710,000	1,060,000	6,940,000	110
1980	1,860,000	1,680,000	1,950,000	1,060,000	6,500,000	110

Table 8. Estimates of female kokanee spawning escapement, potential egg deposition, fall abundance of kokanee fry, and their subsequent survival rates in Coeur d'Alene Lake, Idaho, 1979-1995.

Year	Estimated female spawning escapment	Estimated potential number of eggs ($x10^6$)	Fry estimate the following year ($x10^6$)	Percent egg to summer fry survival
1996	707,000	506		
1995	1,425,000	446	4.02	0.90
1994	250,000	64	2.0	0.31
1993	240,000	92	5.95	6.46
1992	488,438	198	5.57	2.81
1991	631,500	167	3.03	1.81
1990	657,777	204	4.86	1.96
1989	516,845	155	3.00	1.94
1988	362,000	119	3.04	2.55
1987	377,746	126	3.42	2.71
1986	368,633	103	6.89	6.68
1985	530,631	167	2.17	1.29
1984	316,829	106	4.13	3.90
1983	441,376	99	0.70	0.71
1982	358,200	120	1.51	1.25
1981	550,000	184	4.54	2.46
1980	501,492	168	2.43	1.45
1979	256,716	86	1.86	2.20

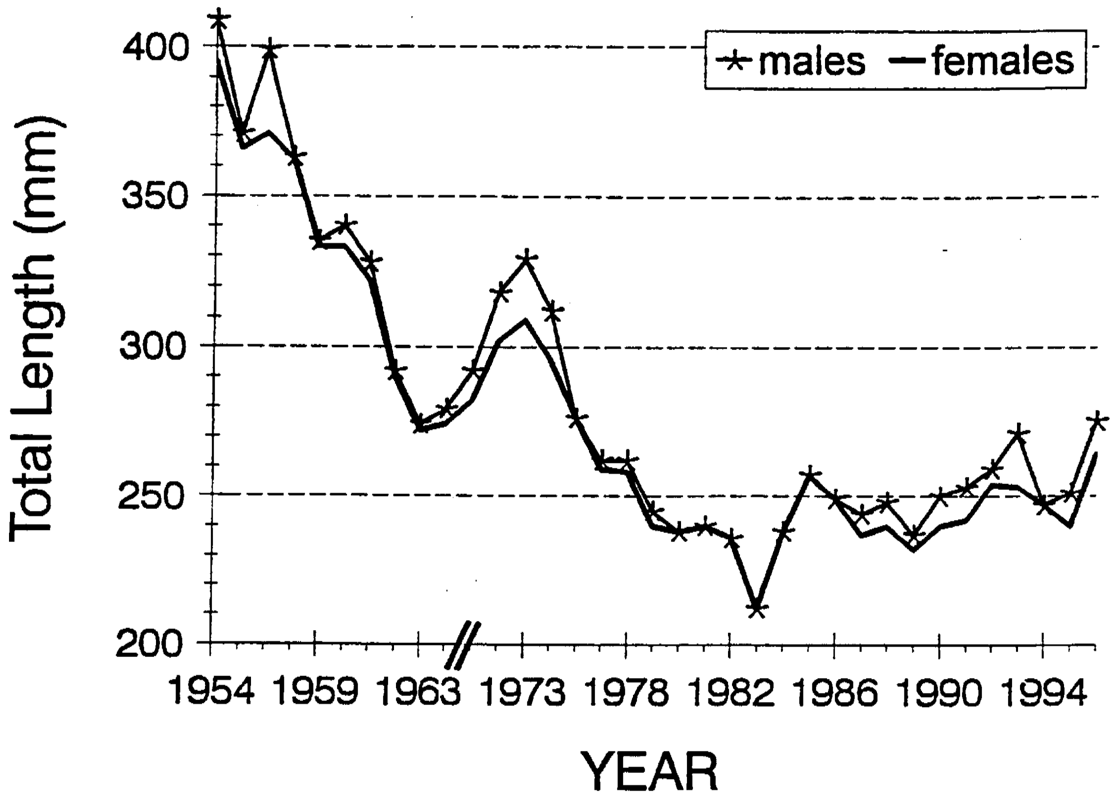

Figure 4. Mean length of male and female kokanee spawners in Coeur d'Alene Lake, Idaho, from 1954 to 1996. Years where mean lengths were identical between sexes are a result of averaging male and female lengths.

Table 9. Chinook salmon redd counts in the Coeur d'Alene River, St. Joe River, Lake Creek, and Fighting Creek, 1989-1996.

Location	Survey Date							
	9/29/89	11/1/90	10/31/91	10/20/92	10/18/93	10/10/94	10/04/95	10/7/96
Coeur d'Alene River								
Cataldo Mission to S.F. Cd'A River	--	41	11	29	80	82	45	54
S.F. Cd'A River to L.N.F. Cd'A River	--	10	0	5	11	14	14	13
L.N.F. Cd'A River to Steamboat Creek	--	--	2	3	6	1	1	13
Steamboat Creek to steel bridge	--	--	--	1	0	0	2	0
S. F. Cd'A River	--	--	--	--	--	13	--	4
L.N.F. Cd'A River	--	--	--	--	--	0	2	0
Subtotal	52	51	13	38	97	110	64	84
St. Joe River								
St. Joe City to Calder	--	4	0	18	20	6	1	59
Calder to Huckleberry C.G.	--	3	1	1	4	0	0	5
Huckleberry C.G. to Marble Creek	--	3	0	2	0	1	0	7
Marble Creek to Avery	--	0	0	0	0	1	0	0
Subtotal	0	10	1	21	24	8	1	71
Lake Creek	--	5	--	3	--	--	--	--
Fighting Creek	--	0	--	1	--	--	--	--
TOTAL	52	70	14	63	121	118	65	155

Table 10. The number and percent of hatchery and wild chinook salmon trapped in Wolf Lodge Creek, Idaho, from 1984 to 1996.

Year		Natural fish trapped: M No.	Natural fish trapped: F No.	Natural fish trapped: Total No.	Natural fish trapped: Total %	Hatchery fish trapped: M No.	Hatchery fish trapped: F No.	Hatchery fish trapped: Total No.	Hatchery fish trapped: Total %	Year hatchery fish stocked	Age	Fin clip
1984		No natural fish return yet				22	13	35	100	1982	2	–
1985		No natural fish return yet				–	–	–	–	1982	3	–
1986		Unknown natural run, hatchery fish not clipped				19	27	46	100	1983	3	–
1987		3 year old fish from 1984 release were not marked				27	7	34	100	1984	3	–
						15	37	52	–	1985	3	AD
		3 year old fish from 1984 release were not marked				3	0	3	–	1985	3	LV
						5	1	6	–	1986	2	RV
1988	Total	25	20	45	42	23	62	58				
						3	6	9	–	1986	3	RV
						46	26	72	–	1987	2	AD
1989	Total	22	31	53	40	49	32	81	60			
						16	43	59	–	1987	3	AD
						23	5	28	–	1988	2	LV
1990	Total	40	43	83	49	39	48	87	51			
						1	6	7	–	1987	4	AD
						41	60	101	–	1988	3	LV
						64	41	105	–	1989	2	RV
1991	Total	50	34	84	28	106	107	213	72			
						2	3	5	–	1988	4	LV
						33	51	84	–	1989	3	RV
						22	3	25	–	1990	2	AD
1992	Total	36	33	69	37	57	57	114				
						1	1	2		1989	4	RV
						18	21	39		1990	3	AD
						3	1	4		1991	2	LV
1993	Total	6	7	13	22	22	23	45	78			

Table 10. Continued.

Year		Natural fish trapped M No.	Natural fish trapped F No.	Natural fish trapped Total No.	Natural fish trapped Total %	Hatchery fish trapped M No.	Hatchery fish trapped F No.	Hatchery fish trapped Total No.	Hatchery fish trapped Total %	Year hatchery fish stocked	Age trapped	Fin clip
						8	14	22		1990	4	AD
						24	49	73		1991	3	LV
						10	4	14		1992	2	RV
1994	Total	29	15	44	29	42	67	109	72			
						9	3	12		1991	4	LV
						14	7	21		1992	3	RV
1995	Total	66	31	97	75	23	10	33	25			
						1	3	4		1992	4	RV
1996	Total	8	33	41	92	1	3	4	8			

Table 11. Number, weight and lengths of fall chinook salmon released into Coeur d'Alene Lake, Idaho, 1982-1996.

Release date	Release site	Number released	Weight (kg)	Length (mm) mean	Length (mm) Range	Rearing hatchery	Stock of fish	Mark
07-19-82	MR[1]	28,700	767	137	125-150	Hagerman	Bonneville	None
10-05-82	I-90	5,700	273	150	130-170	Hagerman	Bonneville	None
Total 82		34,400	1,040					
08-09-83	I-90	30,100	289	109	80-130	Mackay	Bonneville	None
10-26-83	I-90	30,000	637	124	80-150	Mackay	Bonneville	None
Total 83		60,100	926					
10-29-84	I-90	10,500	373	150	80-190	Mackay & Mullan	Lake Michigan	None
10-16-85	I-90	11,100	409	136	--	Mackay & Mullan	Lake Michigan	Left ventral
10-17-85	I-90	7,400	273	143	--	Mackay & Mullan	Lake Michigan	Adipose
Total 85		18,500	682					
07-02-86	I-90	29,500	375	114	81-145	Mackay	Lake Michigan	Right ventral
07-01-87	I-90	59,400	900	119	62-155	Mackay	Lake Michigan	Adipose
07-16-88	I-90	44,600	977	133	95-180	Mackay	Lake Coeur d'Alene	Left ventral
07-06-89	I-90	35,000	636	126	100-165	Mackay	Lake Coeur d'Alene	Right ventral
07-10-90	MR	35,700	626	123	80-145	Mackay	Lake Coeur d'Alene	Adipose
07-10-90	MR	650[2]	11	123	80-145	Mackay	Lake Coeur d'Alene	Ad/right vent
Total 90		36,350	637					
07-09-91	MR	41,600	750	129	75-151	Mackay	Lake Coeur d'Alene	Left ventral
07-09-91	MR	1,050[2]	16	129	75-151	Mackay	Lake Coeur d'Alene	Ad/Left vent
Total 91		42,650	766					
07-07-92	MR	10,000	500	132	115-150	Mackay	Lake Coeur d'Alene	Right ventral
1993		0	No hatchery chinook were stocked in 1993					
06-06-94	I-90	17,267	910	134	110-180	Nampa	Lake Coeur d'Alene	Adipose
06-26-95	I-90	30,198	1,050	124	90-145	Nampa	Lake Coeur d'Alene	Left ventral
06-25-96	MR	39,700	1,510	122	85-145	Nampa	Lake Coeur d'Alene	Right ventral

[1] MR = Mineral Ridge boat ramp. [2] Sterile triploid fish from heat-shocked eggs.

Priest Lake and Upper Priest Lake

Lake Trout Hydroacoustic Surveys-The total population estimate of all fish greater than 50 mm in Priest Lake was 170,367. The estimate of fish from 330 mm to 457 mm was 9,744. The estimate of fish from 457 mm to 660 mm was 4,967, and the estimate of fish larger than 660 mm was 7,885. The total number of fish larger than 330 mm (fish that are likely predominately lake trout and are of a catchable size) was 22,595. For most intervals, these estimates are similar to the population estimates from 1995 (Table 12). In ten transects on Upper Priest Lake, we identified only two targets with signal strengths greater than -35 dB (from a total of 3,455 targets), which was not sufficient to accurately estimate total lake trout population (Table 13).

Lake Trout Tagging-A total of 10 tagged lake trout were reported in 1996. Of these fish, 7 were tagged in September and October of 1995 by the volunteer angler (R. Phelps). Lake trout were recaptured an average of 3 km (approximately) from the site of original capture. The furthest distance from capture in 1996 was a 560 mm fish harvested just north of Cape Horn on August 5, that was tagged in September, 1995 off the northeast point of Bartoo Island, a distance of around 6 km. Growth ranged from 0 to 10 cm per year (Table 14). Two of the three "no growth" values were from fish for which anglers provided weight but not length at time of capture. It is possible that these fish lost weight, but also likely that angler estimates of weight are not highly accurate where growth would be measured in ounces.

Three of the seven fish (42%) tagged in 1995 and recaptured in 1996 were punctured in the swim bladder to relieve excess pressure and facilitate a return to the bottom. Of the 245 fish tagged in 1995, swim bladders of 78 (32%) were deflated before releasing the fish. Although the tag returns indicate a slightly higher survival rate of the punctured fish, a Chi-square test of independence indicated no significant difference between return rates of the treated and untreated fish ($\chi^2 = 0.1364$, df = 1, $P > 0.1$). Additional tag returns will help evaluate whether the higher return rate is a result of better survival, or an artifact of the small sample size.

Cocolalla Lake

Channel Catfish Spawning Potential-Examination of the underwater structures failed to confirm any use by channel catfish. Water temperatures recorded by the thermograph seldom exceeded 20°C (Figure 5), the approximate temperature reported by Pflieger (1975) and Marzolf (1957) associated with the onset of channel catfish spawning. Temperatures never reached the range of 26.6 °C, the optimal spawning temperature reported by Scott and Crossman (1973).

Fish Kill Investigation-We collected 145 dead fish on July 2. Of these, 95 were channel catfish, ranging in length from 290 to 635 mm (TL), and 39 were yellow perch *Perca flavescens* from 122 to 210 mm. The remaining fish collected were five brown bullheads *Ameiurus nebulosus,* three black crappie *Poxomis negromaculatus*, two suckers *Catostomus macrocheirlus and/or C. Columbianus*, one largemouth bass, and one pumpkinseed (Appendix K). Dissolved oxygen levels throughout the water column were at least 7 mg/l in most of the sites tested. In the two deepest sites (9 and 11 m), DO levels dropped to less than 2 mg/l in the bottom 1-2 m (Appendix L).

The subsequent search for additional mortalities on July 8 indicated no recently killed fish, with the exception of a single pumpkinseed. The two overnight gillnets captured a total of 36 channel catfish, 97

Table 12. Simrad hydroacoustic estimates of fish density (fish/ha) by size class and transect, and total population estimate for Priest Lake, Idaho, May 22, 1996.

Transect Number	Transect Code	<-35 dB (< 330 mm)		-35 dB to -32 dB (330-460 mm)		-32 dB>-29dB (460-660 mm)		-29dB > (>660 mm)		∑ -35 dB > (>330 mm)	
		1995	1996	1995	1996	1995	1996	1995	1996	1995	1996
1	1 > 2	7.37	0.00	0.00	3.00	3.63	0.00	0.00	0.00	3.63	3.00
2	4 > 5	0.00	0.06	0.00	0.00	0.00	0.00	4.00	6.44	4.00	6.44
3	7 > 6	4.74	0.30	0.54	1.04	0.30	0.28	0.42	0.38	1.26	1.70
4	9 > 13	21.75	17.00	3.48	1.60	2.32	1.20	1.45	0.20	7.25	3.00
5	17 > 16	0.66	1.90	0.44	0.00	0.00	0.00	0.00	0.10	0.44	0.10
6	18 > 19	0.66	28.00	0.00	0.00	0.00	0.00	1.32	0.00	1.32	0.00
7	15 > 21	10.35	10.01	2.55	1.30	1.20	0.90	0.75	0.78	4.50	2.98
8	22 > 23	10.80	17.60	2.40	1.54	1.20	1.32	0.60	1.54	4.20	4.40
9	24 > 27	9.00	11.88	1.50	2.34	1.95	2.34	2.55	1.26	6.00	5.94
10	28 > 29	2.16	21.62	1.80	0.92	0.00	0.46	0.72	0.00	2.52	1.38
11	31 > 30	4.00	43.12	0.00	0.88	0.00	0.00	0.00	0.00	0.00	0.88
12	34 > 33	13.60	18.80	0.80	1.00	0.80	0.00	0.80	0.20	2.40	1.20
13	35 > 36	2.28	21.16	0.42	0.92	0.18	0.23	0.12	0.69	0.72	1.84
14	37 > 38	1.00	22.54	0.50	0.23	0.00	0.00	0.50	0.23	1.00	0.46
15	39 > 40	9.00	20.47	0.00	0.69	0.00	1.15	0.00	0.69	0.00	2.53
Sum of Transects		97.37	234.46	14.43	15.46	11.58	7.88	13.23	12.51	39.24	35.85
Mean of Transects		6.49	15.6	0.96	1.03	0.77	0.53	2.62	0.83	2.62	2.39
Standard Deviation (density)		6.07	12.0	1.12	0.86	1.10	0.71	1.10	1.62	2.24	1.97
Standard Error (population)		14822.90	29307.0	2,731.70	2087.73	2694.96	1725.28	2705.66	3960.13	5463.33	4808.81
Standard Deviation (population)		57408.86	113505.6	10579.81	8085.74	10437.53	6682.01	10478.98	15337.51	21159.40	18624.45
Total Population Estimate		**61,369**	**147,772**	**9,095**	**9,744**	**7,298**	**4,967**	**8,338**	**7,885**	**24,732**	**22,595**
95% Error Bounds		± 26,088	± 51,580	± 4,808	± 3,674	± 4,734	± 3,037	± 4,762	± 6,970	± 9,615	± 8,464
90% Error Bounds		± 31,869	± 63,010	± 5,873	± 4,489	± 5,794	± 3,709	± 5,817	± 8,514	± 11,746	± 10,339

Table 13. Simrad hydroacoustic estimates of fish density (fish/ha) by size class and transect, and total population estimate for Upper Priest Lake, Idaho, May 22, 1996.

Transect Number	Transect Code	<-35 dB (< 330 mm)		-35 dB to -32 dB (330-460 mm)		-32 dB>-29dB (460-660 mm)		-29dB > (>660 mm)		∑ -35 dB > (>330 mm)	
		1995	1996	1995	1996	1995	1996	1995	1996	1995	1996
1	47--46	0.00	80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	48--49	20.00		0.00		0.00		0.00		0.00	
3	52--51	64	216	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	54--45	359	191	3.59	0.00	0.00	0.00	14.36	0.00	17.95	0.00
5	53--54		404		0.00		0.00		0.00		0.00
6	51--53		210		0.00		0.00		0.00		0.00
7	49--52		121		0.00		0.00		0.00		0.00
8	50--49		105		0.00		0.00		0.00		0.00
9	55--50		88		0.00		0.00		0.00		0.00
10	48--55		112		0.00		0.00		0.00		0.00
11	47--48		165		0.00		0.00		0.00		0.00
Mean of Transects		110.75	169.2	0.90	0.00	0.00	0.00	3.59	0.00	4.49	0.00
Standard Deviation (density)		167.65	96.46	1.80	0.00	0.00	0.00	7.18	0.00	8.98	0.00
Standard Error (population)		95054.83	54694.39	1017.77	0.00	0.00	0.00	4071.06	0.00	5088.83	0.00
Standard Deviation (population)		47527.42	17295.89	508.88	0.00	0.00	0.00	2035.53	0.00	2544.41	0.00
Total Population Estimate		**62,795**	**95,936**	**510**	0.00	0.00	0.00	**2,036**	0.00	**2,546**	0.00
95% Error Bounds		302,464	123,719	3,3239	-	-	-	12,954	-	16,193	-
90% Error Bounds		223,664	100,255	2,395	-	-	-	9,579	-	11,974	-

[a]Estimates of density, population, and variability not valid.

Table 14. Location, size, and growth of lake trout recaptured in Priest Lake, Idaho, 1996.

	Recapture Location				Mark Location				Total Growth		Annual Growth		Distance	Gas bladder
Tag	Date	Ln	wt.	location	Date	Ln	wt (kg)	location	Ln (mm)	wt (kg)	Ln (mm)	wt (kg)	(km)	Punctured
J-H94	4/6/96	762	4.87	NE.Bartoo	12/6/79	ND	1.8	Kalispell	-	3.0	-	0.19	2	n
J-H94	3/12/94	762	ND	NE Bartoo	12/6/79	ND	1.8	Kalispell	-		-		2	n
R1-195 bl	5/25/96	457	0.90	Cav. Bay	10/23/95	457	0.82	8-mile	0	-0.12	0	-0.10	4	y
R1-187 bl	6/10/96	ND	ND	Kalis. Bay	10/15/95	457	0.96	NE Bartoo	-	-	-	-	3	n
R1-001 bl	6/19/96	560	ND	Indian rock	9/7/95	457	0.90	NE Bartoo	103	-	100	-		y
R1-153 bl	9/10/96	ND	1.36	Kalis. Bay	10/10/95	533	1.64	NE Bartoo	-	-0.3	-	-0.3	2	y
A000508 wt	7/20/96	622	2.27	Copper Bay	5/21/91	483	0.90	W. Twin Is.	139	1.37	28	0.27		n
00248 yel	8/25/96	851	8.16	Copper Bay	10/25/86	648	2.27	2-Mouth Cr.	203	5.89	21	0.6		n
R1-143 bl	8/25/96	ND	1.1	n outlet Bay	10/6/95	495	1.2	NE Bartoo	-	-0.1	-	-0.1	3	n
R1-057 bl	8/20/96	457	0.68	Cav. Bay	9/18/95	457	0.90	SE Bartoo	0	-0.2	0	-0.2	2.5	n
R1-055 bl	8/5/96	560	1.1	Cape Horn	9/18/95	464	1.1	NE Bartoo	96	0	96	0	6	y

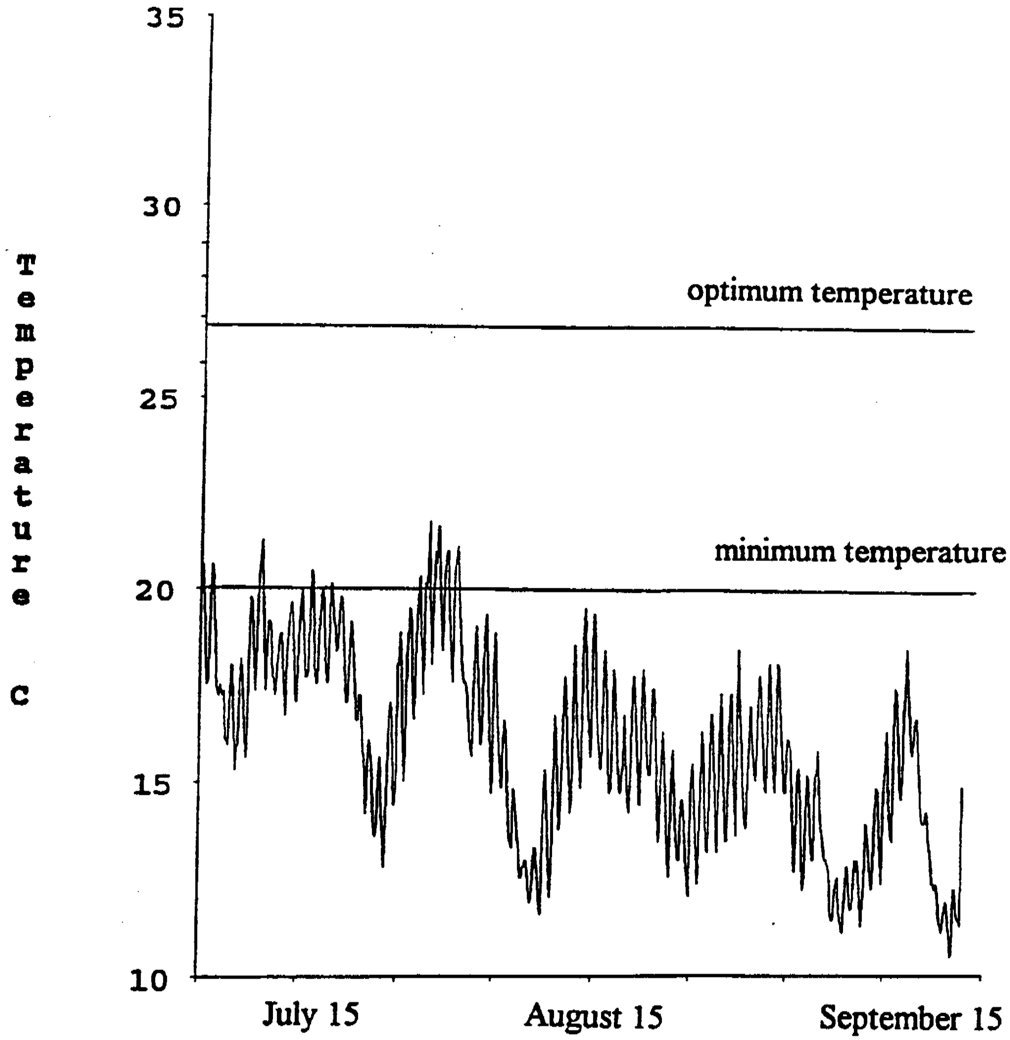

Figure 5 Temperatures recorded by thrmograph in Cocolalla Lake, Idaho, from July 2 to September 18, 1996, and the reported minimum (Marzolf 1957; Pflieger 1975) and optimal (Scott and Crossman 1973) temperatures for channel catfish spawning.

yellow perch, 7 suckers, 4 black crappie, 2 pumpkinseed, and 1 brook trout (Appendix M). None of these fish showed any external signs of morbidity. A subsample of 12 channel catfish, representing a range of size-classes, was shipped to the Eagle Fish Health Laboratory for analysis. The necropsies indicated that the sudden widespread mortality in Cocolalla Lake in June was probably not related to an epizootic outbreak (Doug Munson, Personal Communication, Eagle Fish Health Lab). Although a metazoan parasite was discovered in the liver of some fish, and saprophytic aeromonad bacteria *Aeromonas sp.* were cultured from the specimens that had died in transport, neither of these infections were likely causative agents of the fish kill. Cool water temperatures in June may have stressed spawning channel catfish and yellow perch. Sudden decreases in water temperatures near the spawning period are occasionally known to result in high mortality rates of channel catfish (Al Van Vooren, Fisheries Research Manager, Idaho Department of Fish and Game, Personal Communication). Furthermore, shortly after our field investigation, we received reports of illegal use of dynamite in Cocolalla Lake, which was possibly related to the fish kill.

Standard Lowland Lake Surveys

Bonner Lake

Lake Characteristics and Management History-Bonner Lake is a 9.83 ha lake located in northeastern Boundary County. The lake has a mean depth of 6.7 m, a maximum depth of 18 m, and a total estimated volume of 656,192 m^3. Most of the land surrounding the lake is privately owned by a single landowner (Wages). IDFG maintains an access area on the west end of the lake consisting of a primitive boat ramp, outhouses, and a camping site. Bonner Lake is currently managed under the statewide general regulations, with the exception of an "Electric Motors Only" restriction.

Bonner Lake was chemically treated in 1955 to eradicate perch, largemouth bass, and pumpkinseeds, and again in 1970 to eradicate pumpkinseeds. It is unclear whether or not the 1970 treatment failed to kill all of the pumpkinseeds or if they were illegally reintroduced, but a population was reestablished by 1972.

Limnological Characteristics-Bonner Lake is a eutrophic system, as evidenced by an anoxic hypolimnion in mid-July. Dissolved oxygen and temperature profiles at two sites both showed a sudden decrease in DO from 7 mg/L to less than 3 at a depth of 3-4 m, and a decrease in water temperature from 23° C at the surface to around 6° C in the hypolimnion (Appendix N). Because of hypolimnetic DO levels and epilimnetic water temperature, available trout habitat in mid-July was limited to the metalimnion. We estimated the total volume providing adequate trout habitat (from around 2.5 to 3.5 m) to be approximately 91,300 m^3, or 14% of the total volume. Secchi disk visibility ranged from 2.5 to 3.0 m, with a mean of 2.75 m, and surface conductivity was 50 μmohs.

Fishery Characteristics-Electrofishing, gillnetting, and trapnetting resulted in collections of four fish species, all classified as gamefish. A total of 429 fish were collected; 46 rainbow trout, one brook trout, 276 largemouth bass, and 106 pumpkinseeds (Appendix N).

Rainbow trout ranged in length from 210 to 369 mm (TL). Based on length (Figure 6) and scale analysis, 43 rainbow trout (93%) were stocked earlier in 1996, and the remaining three were holdovers from

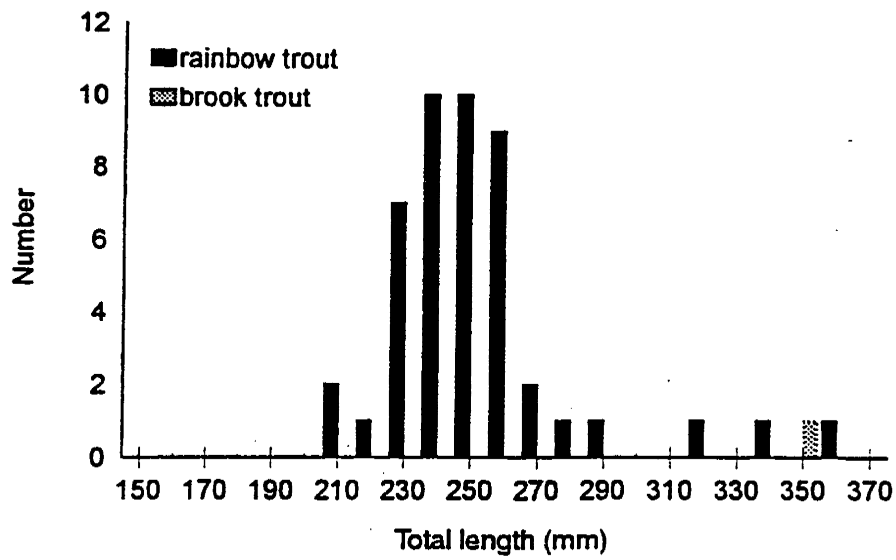

Figure 6. Length of rainbow trout and brook trout in Bonner Lake, Idaho, electrofishing and gillnet samples, July 1996.

the 1995 stocking. Assuming an approximate length of 230 mm at stocking, the holdover fish grew 90-130 mm after being stocked in the summer of 1995. Relative weight (W_r) of rainbow trout ranged from 82 to 110 and averaged 100. Numerically, rainbow trout comprised only 11% of the total sample, but accounted for 34% of the weight. The W_r of the single brook trout was 90.

Largemouth bass were the most abundant species collected, both by number (64%) and by weight (53%). Lengths ranged from 70 to 445 mm TL (Figure 7). Of 273 largemouth bass collected in the survey, only 9 were of a legally harvestable size. The Proportional Stock Density (PSD = 45) was within the range of values indicative of a balanced fish population, but would be considered low where the management objective is large bass (Willis et al. 1993). Based on back calculation with scales, largemouth bass grow slowly in Bonner Lake (Table 15), and fish are around seven years old before achieving harvestable size. These growth rates are among the slowest for largemouth bass in Idaho lakes (Dillon 1995). Relative weight was 98.9, indicating almost average condition.

Pumpkinseeds sampled were too small to contribute to the fishery. The modal length was 115 mm, and the largest individual collected was 165 mm. Proportional stock density was 4.7, well below the range indicative of a balanced population (Willis et al. 1993). Pumpkinseeds, though numerically important (25%), constituted only 11% of the sample weight.

Bloom Lake

__Lake Characteristics and Management History__-Bloom Lake is a 9.2 ha lake located in Bonner County about 2 km west of McArthur Lake. The lake is bordered by state and private land. A road and access point lying partially on private land have been open to public use on the eastern side of the lake (Appendix O). We estimated mean and maximum depths at around 2.2 and 5.8 m, respectively and a total water volume of 200,350 m^3. In recent years, Bloom Lake has been stocked annually with 4,000 to 10,000 brook trout fingerlings (age-0), and managed under general fishing regulations (with the exception that the bonus brook trout limit does not apply). In addition to brook trout, 500 splake were stocked in 1990, 1992, and 1993, and 2,000 westslope cutthroat were stocked in 1992. Pumpkinseeds were apparently introduced illegally and were first reported by fishermen in 1992.

__Limnological Characteristics__-Temperature and DO profiles of Bloom Lake indicated a deep epilimnetic layer. Although DO levels were sufficient for trout (>5 mg/L) throughout the water column, water temperatures were above 20°C in the upper 3.5 m of water. The hypolimnion was not well developed, and water temperature exceeded 15° C, even at the deepest point of the lake. Because of the high water temperatures and the limited hypolimnetic layer, we estimated the total summer volume of trout habitat at only 11,400 m^3, or 5.7% of the total lake volume (Appendix O). Secchi disk visibility ranged from 2 to 2.5 m, and conductivity at the surface was 70 µmohs.

__Fishery Characteristics__-We collected a total of 365 fish with the combined sampling equipment (Appendix O). Of these, 109 (30%) were brook trout and the remaining 256 were pumpkinseeds. Sixty-five percent of the sampled biomass was comprised of brook trout, and the remaining 35% was pumpkinseeds. Brook trout ranged from 120 to 289 mm TL, with a modal length of 235 mm and were one to three years old. The majority of harvestable size (200+ mm) fish were age-2 (Figure 8). Incremental growth averaged 55 mm

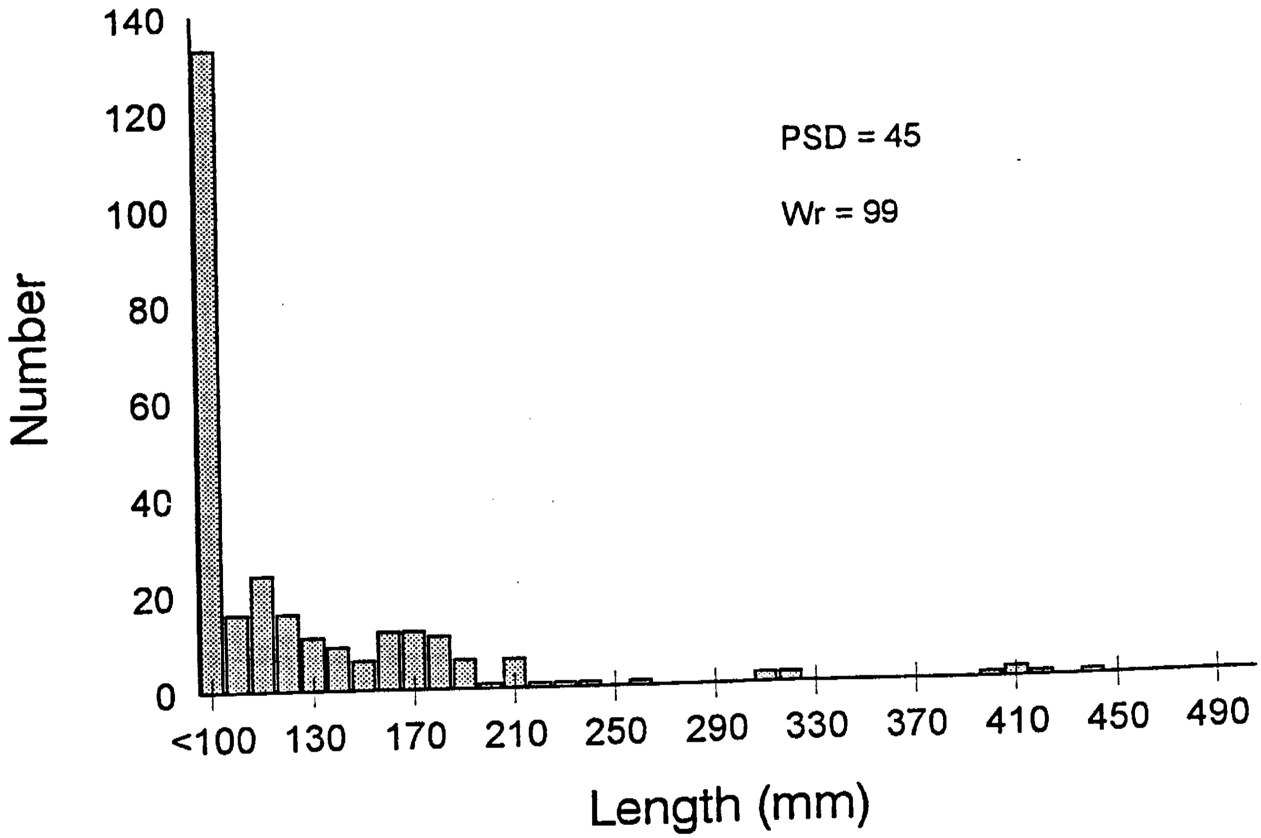

Figure 7. Length frequency of largemouth bass collected from Bonner Lake, Idaho, with electrofishing equipment and gillnets during June and July, 1996.

Table 15. Mean length at age (length at time of annuli formation) for largemouth bass in Bonner Lake, Anderson Lake, and Blue Lake, Idaho, in 1996 and from 1990 (Horner et al. in press[b]) and 1989-90 (Dillon 1992).

Lake	age-1	age-2	age-3	age-4	age-5	age-6	age-7	age-8	age-9	age-10
Bonner	62	99	133	169	209	242	304	354	377	401
Anderson	80	147	205	250	292	330	356	386	407	430
(1990)	(82)	(180)	(263)	(320)	(360)	(383)	(410)			
Blue	74	136	201	255	298	337	371	406	421	
(1989-90)	(76)	(170)	(244)	(310)	(340)	(371)				

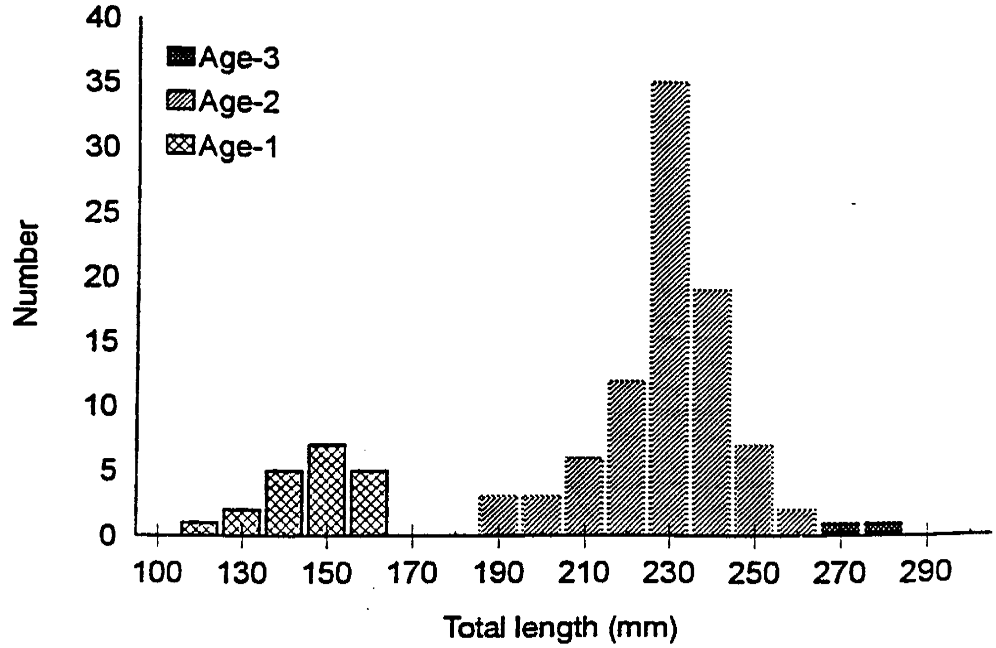

Figure 8. Length and age of brook trout collected from Bloom Lake, Idaho, with electrofishing equipment and gillnets during July, 1997.

from age-1 to age-2 and 49 mm from age-2 to age-3. The moderate growth rates and lack of older fish resulted in a PSD of zero (quality size = 330 mm, stock size = 200 mm). Relative weight of brook trout ranged from 78 to 124 and declined rapidly with the larger size classes (Figure 9).

Pumpkinseeds ranged in size from 77 to 165 mm TL, with a modal length of 135 mm. Proportional stock density was only 8, and pumpkinseeds were not large enough to contribute significantly to the fishery.

Anderson Lake

Lake Characteristics and Management History-Anderson Lake, located adjacent to the mouth of the Coeur d'Alene River, is the western most lake in the series known as the lateral lakes. Anderson Lake has a mean depth of 3.7 m and a surface area of 292 ha. Boat access is through a channel connecting Anderson Lake to the Coeur d'Alene River. Typical of the lateral lakes, it supports fisheries for largemouth bass, northern pike, and black crappie. Other game species present are yellow perch, pumpkinseeds, and bullheads (black and brown). Nongame species present include longnose sucker, largescale sucker, northern squawfish, and tench.

Anderson Lake is currently managed to provide a quality bass fishery. Regulations prohibit harvest of largemouth bass between 12 and 16 inches, and only two fish may be harvested during the open season, which is restricted to July 1 through December 31. These regulations have been in effect since 1992. From 1984 to 1992, harvest was restricted to July 1 through December 31, with a minimum size of 14 inches. Prior to 1984, the limit for largemouth bass was ten fish, only two of which could be over 17 inches. Prior to 1996, the most recent assessment of the largemouth bass population was in 1990. The goal of the 1990 survey was to evaluate the effects of the 14 inch minimum size and seasonal harvest restrictions. The PSD of largemouth bass had decreased to 83 from the previous level of 93 in 1983. Combined with additional stock assessment information Horner et al. in press[b]), the PSD indicated the restrictive regulations were providing a more balanced largemouth bass population and a quality bass fishery. The purpose of the 12-16 inch slot limit imposed in 1992 was to make Anderson Lake consistent with statewide quality bass regulations (while maintaining the restrictive harvest credited for improving the fishery).

Limnological Characteristics-Temperature profiles in mid-July show a gradual thermal decline from the surface to the bottom at 5 m. Similarly, DO levels declined gradually with depth, and were less than 5 mg/L on the substrate (Appendix P). The weak stratification depicted by the temperature and DO profiles is likely a result of wind mixing and the shallow mean depth. Temperature and DO were measured on July 11, and a more distinct hypolimnion likely developed later in the summer. Secchi disk visibility averaged 1.9 m over four sites around the lake. Surface conductivity was 68 μmhos and pH was 6.4.

Fishery Characteristics-The total catch for the combined gear sampling effort specified in the lake survey methodology was (by order of abundance) 124 yellow perch, 56 pumpkinseeds, 56 bullheads (black and brown) , 39 largemouth bass, 15 tench, 11 suckers (largescale and bridgelip), 10 northern pike, 9 black crappie, and 5 northern squawfish . Gamefish constituted 90.5% by number and 60% by weight of the fish sampled (Appendix P).

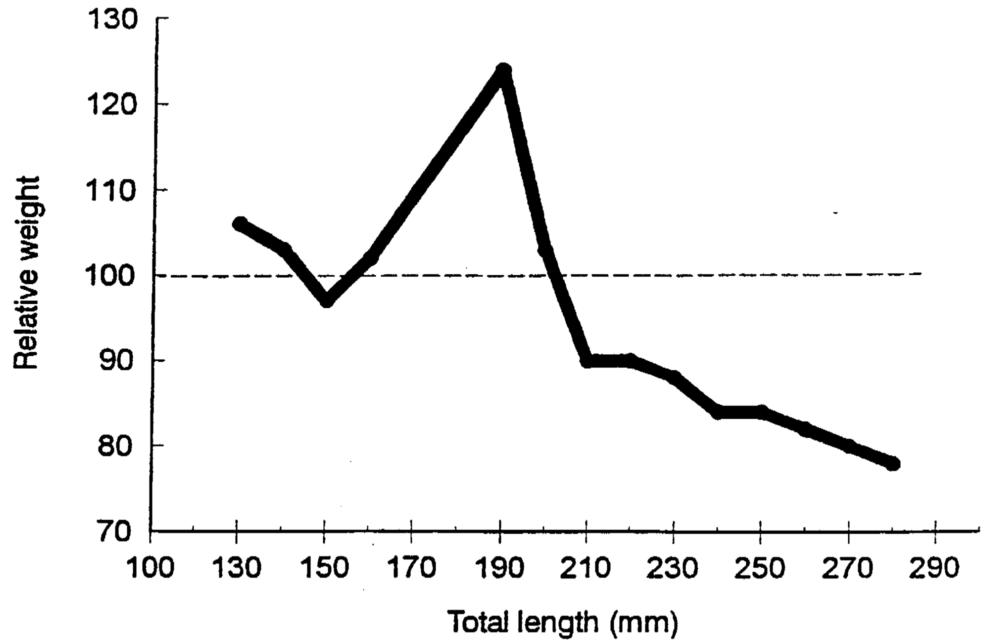

Figure 9. Mean relative weight of brook trout by size group collected from Bloom Lake, Idaho, with electrofishing equipment and gillnets during July, 1996.

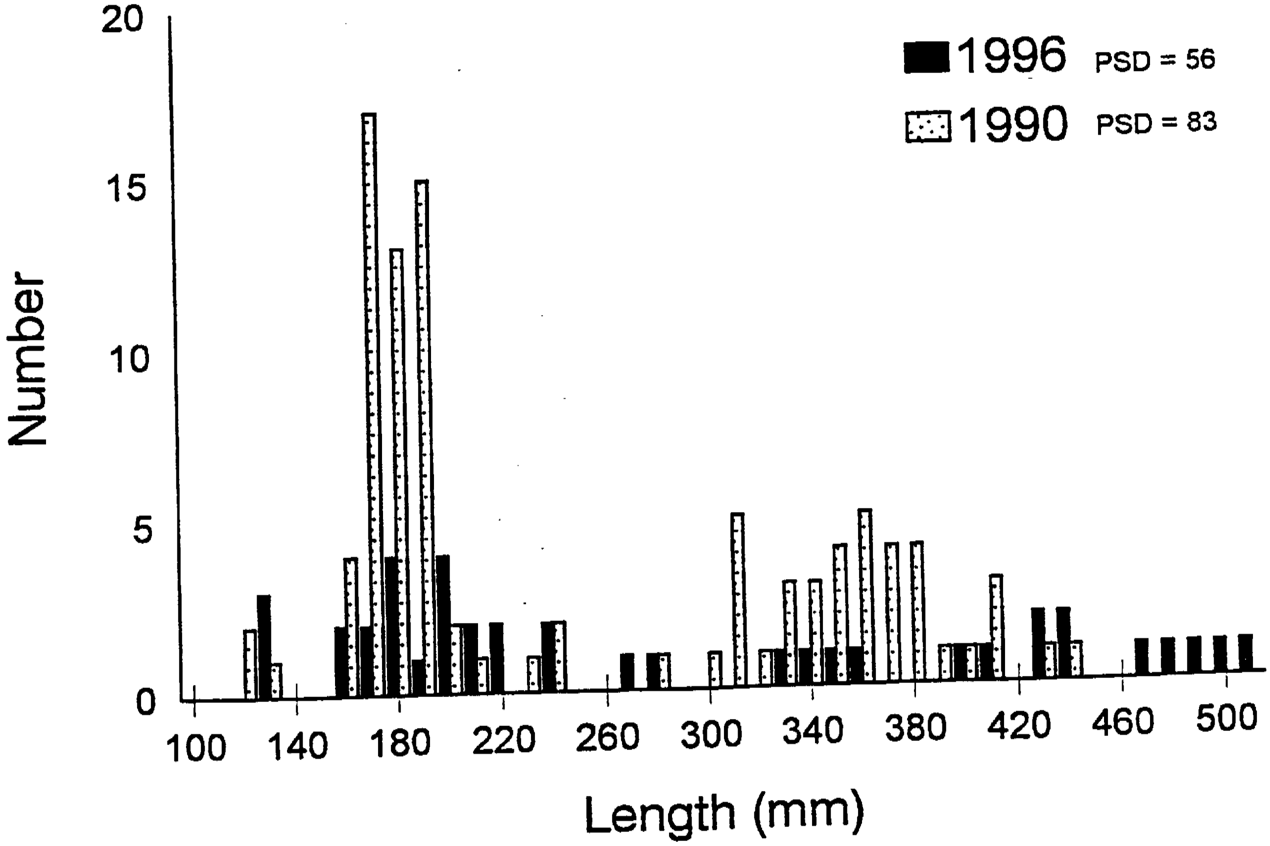

Figure 10. Length of largemouth bass collected from Anderson Lake, Idaho, in 1996 and in 1990.

Largemouth bass ranged from 130 mm to 519 mm (Figure 10), with a modal length of 185 and 205 (four fish in each category). Proportional stock density was 56, and RSD-P was 41 (**note:** these estimates are based on fish collected in June, and comparisons with samples collected in September or October could be misleading). Relative weight declined with length (Figure 11). Mean W_r was 102 for fish 200-299 mm, 91 for fish 300-399 mm, and 77 for fish 400-499 mm. Growth was slow relative to growth estimates in 1990 (Table 15). Based on aging and back calculation, most largemouth bass reach 305 mm at around 5 ½ years, whereas in 1990 fish reached 305 mm around four years of age. Back calculating length-at-age confirmed scale analysis from 1990 by showing rapid growth for the 1984 and 1985 age classes.

Black crappie ranged from 140 to 239 mm TL. Proportional stock density and W_r were 22 and 101, respectively; however, only nine black crappie were collected, so these indices are of limited use. Growth of black crappie was comparable to other systems in northern Idaho, with the exception that age-2 and age-3 fish were estimated to be approximately the same size. This is not surprising in that 1993 was marked by an unusually cool summer, low zooplankton densities and a very short growing season for warmwater fish. Based on scale analysis, black crappie attain quality size (200 mm; Gablehouse 1984) at 4 to 5 years (Table 16). The oldest black crappie sampled in 1996 was 235 mm and estimated to be five years old.

Northern pike ranged in length from 430 to 689 mm and weighed from 0.5 to 1.8 kg. Mean relative weight was 100, and PSD was 30. No "prefered" size (> 710 mm; Gablehouse 1984) northern pike were collected, and RSD-P was zero. The ten northern pike collected were 2 - 5 years old (Table 16). Estimated growth of northern pike collected in 1996 averaged 23% slower (for age-1 to age-3 fish) than of fish collected in 1989 from the chain lakes (Rich 1992). Of the seven northern pike that were aged, three were from the 1993 year-class, which may account for the relatively slow growth of the 1996 sample.

Yellow perch and pumpkinseeds were generally too small to contribute significantly to the fishery. Modal sizes of yellow perch and pumpkinseeds collected in gillnets were around 155 mm and 100 mm, respectively. Mean W_r values were 80 for yellow perch and 135 for pumkinseeds.

Blue Lake

Lake Characteristics and Management History-Blue Lake is located about 8 km from the mouth of the Coeur d'Alene River, approximately in the center of the lateral lakes. Blue Lake has a mean depth of 4.5 m and a surface area of around 81 ha. The shoreline is privately owned, and nearly all fishing on Blue Lake is from a boat. The only public access is through a channel connecting the lake to the Coeur d'Alene River. Blue Lake has the same species components as Anderson Lake and also supports fisheries for largemouth bass, northern pike, and black crappie.

Blue Lake is currently managed to provide a trophy bass fishery. Regulations prohibit harvest of largemouth bass less than 20 inches, and only two fish may be harvested. These regulations have been in effect since 1992. From 1990 to 1992, harvest was prohibited to provide a high quality fishery for large bass. From 1984 to 1990, harvest was restricted to July 1 through December 30, with a minimum size of 14 inches, and prior to 1984 the limit for largemouth bass was ten fish, only two of which could be over 17 inches.

As with Anderson Lake, the most recent assessment of the largemouth bass population prior to 1996 was in 1990. The goal of the 1990 survey was to evaluate the effects of the harvest restrictions. The PSD of

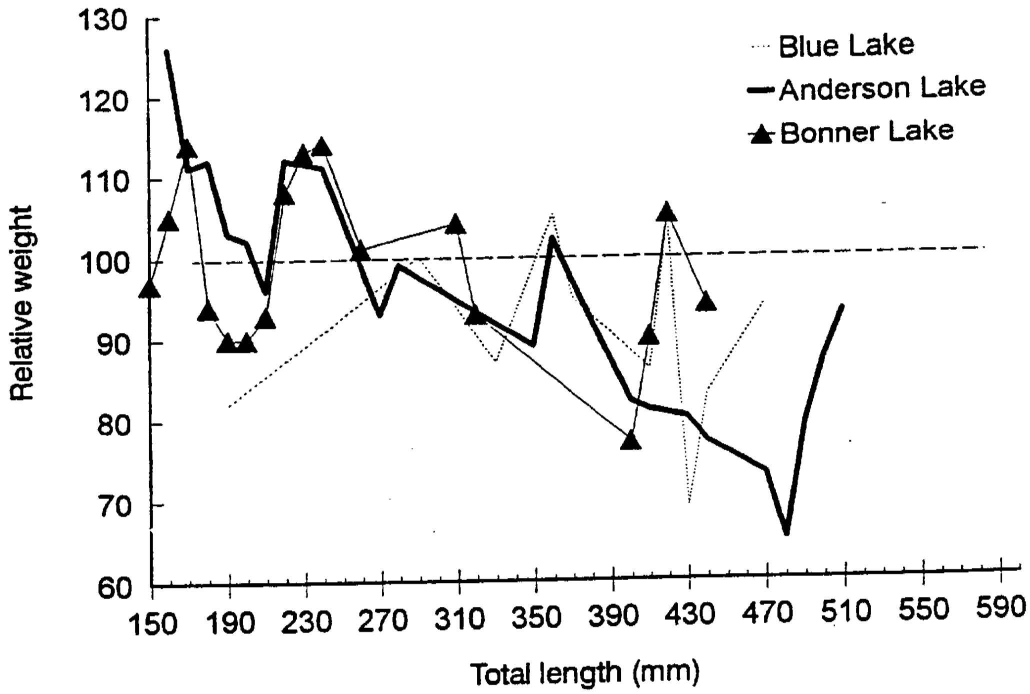

Figure 11. Relative weights of largemouth bass collected from Bonner Lake, Anderson Lake, and Blue Lake, Idaho, in May and June, 1996.

Table 16. Mean length at age (length at time of annuli formation) for selected gamefish in Bonner Lake, Bloom Lake, Anderson Lake, and Blue Lake in 1996 and previous studies (in parentheses).

	Age-1	Age-2	Age-3	Age-4	Age-5	Age-6	Age-7
Anderson Lake							
Largemouth bass	80	147	205	250	292	330	356
(1990)	(82)	(180)	(263)	(320)	(360)	(383)	(410)
Black crappie	98	141	164	200	228		
Northern pike	246	348	445	596	633		
(1989-90[a])	(296)	(478)	(591)				
Blue Lake							
Largemouth bass	74	136	201	255	298	337	371
(1989-90)	(76)	(170)	(244)	(310)	(340)	(371)	
Black crappie	74	131	171	206	227	238	261
Northern pike	304	425	515	571			
(1989-90[a])	(296)	(478)	(591)				
Bonner Lake							
Largemouth bass	62	99	133	169	209	242	304
Bloom Lake							
Brook trout	138	200	241				

[a] Length at age information from combined lateral lakes (Rich 1992)

largemouth bass had decreased to 83 from the previous level of 93 in 1983. Based on the 1990 investigations, Horner et al. (in press[b]), reported the harvest closure was providing a high quality largemouth bass fishery and recommended continuation of the restrictive regulations. The purpose of the 20 inch minimum size imposed in 1992 was to make Blue Lake consistent with statewide trophy bass regulations (i.e. primarily a catch-and-release fishery with very limited harvest opportunity for trophy fish).

Limnological Characteristics-Surface water temperature on July 11 was 22.1 °C. Temperature dropped gradually from two to six meters, where the bottom temperature was 16.4 °C. Dissolved oxygen was around 7 mg/L throughout the water column, except for the area immediately off the substrate, where DO was 1.5 mg/L (Appendix Q). Secchi disk visibility was 3.1 meters, or about a meter greater than in Anderson Lake. Surface pH and conductivity were 7.4 and 60 µmhos, respectively.

Fishery Characteristics-Yellow perch and bullheads (brown and black) were the most abundant fish collected in the standard sampling effort (Appendix Q). These three species accounted for 81% of the total sample by number, and around 34% by weight. Largemouth bass, northern pike, and black crappie, probably the most sought after game species present, accounted for about only 8% of the sample by total number, but around 31% by weight. Nongame species only accounted for about 9% of the total number sampled, but accounted for around 35% of the total weight. Tench were the most numerous nongame species at 8.7% of the total sample, and suckers (longnose and largescale) were less than 1% of the total sample.

We collected 18 largemouth bass, ranging from 75 to 555 mm TL (Figure 12). Estimated age ranged from 1 to 11 years. Largemouth bass growth was comparable to other northern Idaho lakes, with fish attaining 305 mm at around five years of age (Table 15). The sample consisted of a disproportionate number of large fish. Over half (56%) of the largemouth bass were over 300 mm, and estimated to be over 5 years old. Only seven fish were collected representing the combined 1993 through 1995 year-classes (ages 1-3), and no fish were collected from the 1992 year-class (age-4). Proportional stock density and RSD-P were 91 and 55, respectively. Relative weight declined with length (Figure 11): W_r was 100 for the 200-299 category (n=1), 96 for the 300-399 category (n=4), 87 for the 400-499 category (n=5), and 83 for the 500-599 category (n=1).

Northern pike sampled were from 390 to 659 mm TL. The sample consisted mostly of quality sized fish (530-710 mm; Gabelhouse 1984) with no preferred or larger fish and very few stock size and smaller fish. The limited range of sizes in the sample resulted in a PSD of 83 and RSD-P of zero. Mean W_r of northern pike was 96.7. Based on back calculations from two fish, growth of northern pike in Blue Lake was comparable to Anderson Lake, and fish achieve quality size (530 mm TL; Table 16) at around 3.5 years of age--or one year later than when Rich (1992) estimated age of northern pike from the lateral lakes in 1989.

Only four black crappie were collected during the standard lake survey, but an additional eight were collected with conventional fishing equipment on June 11. Size ranged from 156 to 305 mm TL. All fish collected with conventional equipment were 220 to 305 mm. Age of black crappie in the combined sample ranged from 2 to 10, with a modal age of 6 years. Only one fish was collected less than 5 years old, indicating very limited recruitment; however, because only four fish were collected using standard lake survey methodology, and conventional fishing equipment probably selected larger fish, size and age structure information is probably not valid for this sample. Back calculation of length-at-age indicates similar growth to black crappies from Anderson Lake (Table 16), and that fish generally attain quality size (200 mm; Gablehouse 1984) at age-4. Mean W_r for fish from 200-299 mm was 90.

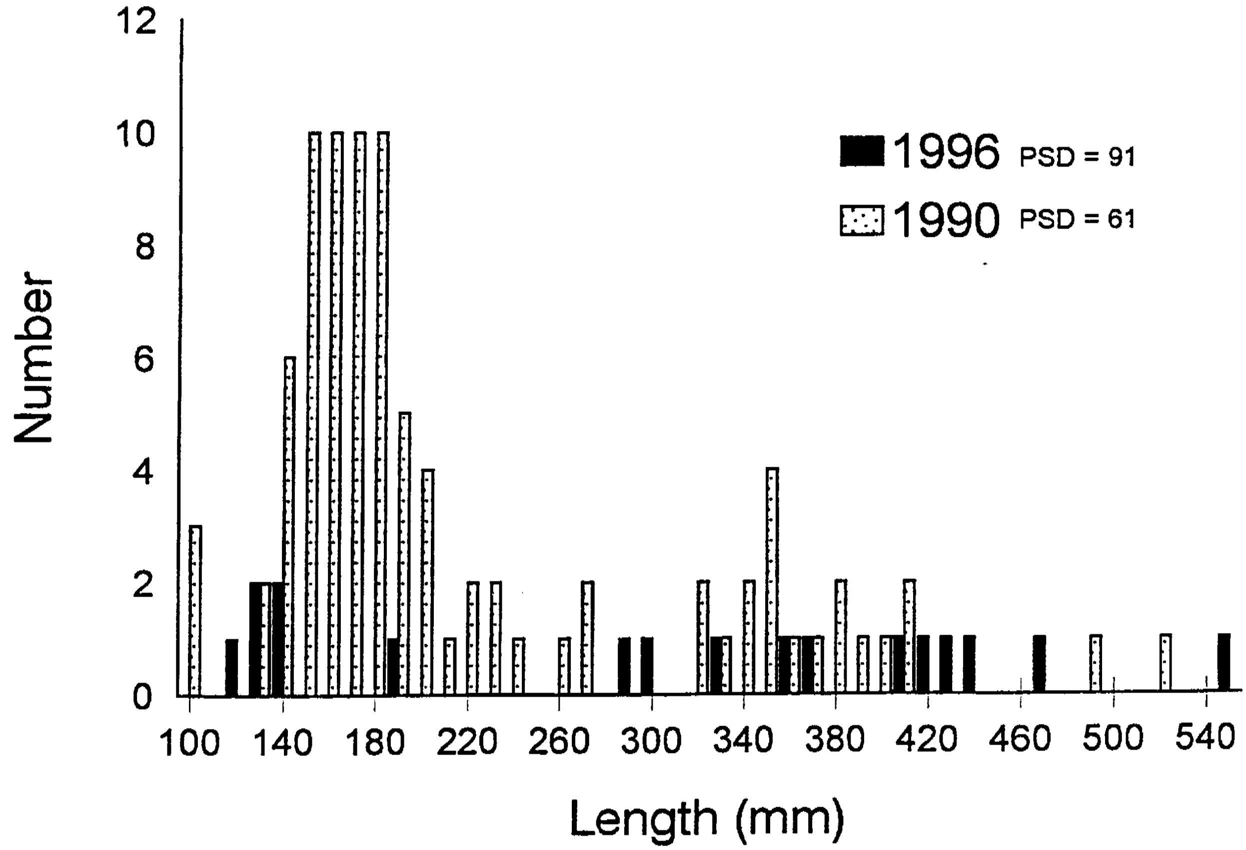

Figure 12. Length of largemouth bass collected from Blue Lake, Idaho, in 1996 and in 1990.

As with Anderson Lake, yellow perch and pumpkinseeds were generally too small to contribute significantly to the fishery. Only 29% of the yellow perch measured were stock length or greater (130 mm; Gablehouse 1984) and modal size of pumpkinseeds was 75, with a PSD of zero. These numbers suggest yellow perch and pumpkinseeds are heavily preyed upon, and the very low PSD values are not unexpected given the exceptionally high PSD and RSD-P values of largemouth bass in both of these lakes (Guy and Willis 1991). Conversely, bullheads (black and brown), which constituted about 28% of the number and biomass represented by the sample, had a PSD of 91, indicating that fishery for these species is limited by interest rather than by size.

DISCUSSION AND RECOMMENDATIONS

Coeur d'Alene Lake

Angler Creel Survey

Angler fishing effort has increased on Couer d'Alene Lake since Mallet (1968) reported an estimated total effort of 169,908 h in 1967. Total fishing effort in 1987 was estimated at 239,581 h (Horner et al. 1988). In recent years, 1979 to 1996, the estimated fishing effort averaged 255,178 h (Table 17).

Angling effort for kokanee has declined approximately 500% since 1979 (Table 18). Previously, angling for kokanee comprised over 90% of the total fishing effort on Coeur d'Alene Lake (Horner et al. 1986), 1987, 1988, Rieman et al. 1980, Rieman and Ward 1981). In 1995-96, fishing effort for kokanee was only 6 20% of the total fishing effort.

Over abundance of kokanee in the early 1980s resulted in smaller, less desirable kokanee. This may have resulted in kokanee anglers leaving Coeur d'Alene Lake to fish for kokanee in Spirit Lake or Lake Pend Oreille. Chinook salmon were introduced in 1982 to reduce the kokanee abundance and produce a more desirable fish. This effort has produced a more desirable kokanee. However, the effort for kokanee has continued to decline (Table 18). The decline should stop, but a return to previous fishing effort for kokanee is unlikely in the near future.

Even though the angling effort for kokanee has declined, kokanee still remain the major component of the harvest. Coeur d'Alene Lake kokanee are managed as a high yield 'low tech' fishery (Fisheries Management Plan 1996-2000). Kokanee provided over 95% of the total fish harvested from Coeur d'Alene Lake in 1995-96. This was similar to harvests in 1967 (Mallet 1968), 1979 (Reiman et al. 1980), 1980 (Reiman and Ward 1981) and 1985, 1986, and 1987 (Horner et al. 1986, 1987, 1988) (Table 19). Reiman et al. (1980) reported an estimated harvest of 578,034 kokanee in 1979. In 1995-96, kokanee harvest was estimated at 95,606. Catch rates for kokanee were the same for both surveys, 2 fish/h. The decline in harvest in 1995-96 was a result of lower fishing effort.

As kokanee effort and harvest have declined, fishing effort and harvest for chinook salmon have increased. Angling effort for chinook salmon comprised 66% of the total fishing effort on Coeur d'Alene Lake in 1995-96. When the chinook salmon fishery began in 1983, most of the fishing took place during the summer months. Now, the chinook salmon fishery continues year round and anglers expended 163,665 h during the 1995-96 survey. Effort and harvest of chinook may have been higher if not for the impact of a major winter flood in February 1996.

The Idaho Department of Fish and Game manages the chinook salmon population at a level that provides more fish in the 2-8 kg range as opposed to fewer but larger 10+ kg fish (Fisheries Management Plan 1996-2000). The chinook salmon fishery is a 'high tech' fishery that requires a major capital investment. The chinook salmon fishery is very popular with four chinook salmon derbies annually. Fifteen percent of the chinook salmon fishing effort occurred during the four derbies and anglers harvested 57% of the annual estimated chinook salmon harvest.

Table 17. Estimated angler effort (h) on Coeur d'Alene Lake, Idaho, 1968, 1979,1980, 1985-87 and 1995-96.

Year	1968[1]	1979[2]	1980[3]	1985[4]	1986[5]	1987[6]	1995-96[7]	Average
Section 1	73,284	85,039	92,944	192,200	172,452	128,699	141,949	126,650
Section 2	24,647	86,344	85,400	--	--	--	43,293	67,940
Section 3	71,976	111,454	69,595	--	--	110,882[8]	65,111	89,260
Total	169,908	282,837	247,939	--	--	239,581	250,371	238,127

[1] Sample period April 29, to November 30, 1967.
[2] Sample period April 15 to November 10, 1979.
[3] Sample period April 27 to November 8, 1980.
[4] Sample period April 27 to September 30, 1985. Surveyed area included the northern end only.
[5] Sample period April 27, to October 30, 1986. Surveyed area included the northern end only.
[6] Sample period April 27, to September 30, 1987.
[7] Sample period July 1, 1995 to June 30, 1996.
[8] Total included Sections 2 and 3.

Table 18. Summary of creel survey estimates for angler effort (h) expended per species in Coeur d'Alene Lake, Idaho, 1979, 1985-87, 1991, 1993, 1995-96.

Year	Kokanee	Chinook salmon	Westslope cutthroat trout	Largemouth bass	Northern pike	Other
1979[1]	280,768	--	2,069	--	--	--
1985[2]	92,837	79,955	--	--	--	--
1986[3]	134,652	37,800	--	--	--	--
1987[4]	212,807	16,794	--	--	--	9,980[8]
1991[5]	--	--	--	--	14,685	--
1993[6]	--	--	--	--	2,142	--
1995-96[7]	49,609	163,665	128	8,707	25,290	--

[1] Sample period April 15 to November 10, 1979.
[2] Sample period April 27, to September 30, 1985. Survey of northern end only.
[3] Sample period April 27, to October 30, 1986. Survey of northern end only.
[4] Sample period April 27, to September 30, 1987.
[5] Sample period March 24, to April 14, 1991.
[6] Sample period March 13, to April 30, 1993.
[7] Sample period July 1, 1995 to June 30, 1996.
[8] Other referred to spiny rayed fish.

Table 19. Summary of creel survey harvest estimates by species for Coeur d'Alene Lake, Idaho, 1968, 1979-80, 1985-87, 1991, 1993 and 1995-96.

Year	Kokanee	Chinook salmon	Westslope cutthroat trout	Largemouth bass	Northern pike	Other
1968[1]	242,207	--	889	--	--	3,015[10]
1979[2]	578,034	--	595	--	--	1,150[11]
1980[3]	465,034	--	--	--	--	--
1985[4]	119,755	240	--	--	--	--
1986[5]	164,275	76	--	--	--	--
1987[6]	238,903	350	--	--	--	9,980[12]
1991[7]	--	--	--	--	672	--
1993[8]	--	--	--	--	81	--
1995-96[9]	95,606	3,313	4	250	523	986[13]

[1] Sample period April 29, to November 30, 1967.
[2] Sample period April 15 to November 10, 1979.
[3] Sample period April 27 to November 8, 1980.
[4] Sample period April 27 to September 30, 1985. Surveyed area included the northern end only.
[5] Sample period April 27, to October 30, 1986. Surveyed area included the northern end only.
[6] Sample period April 27, to September 30, 1987.
[7] Sample period March 24, to April 14, 1991.
[8] Sample period March 13, to April 30, 1993.
[9] Sample period July 1, 1995 to June 30, 1996.
[10] Other included, rainbow trout, yellow perch, bullheads, and largemouth bass.
[11] Other included, yellow perch only.
[12] Other included, spiny rayed fish.
[13] Other included, pumpkinseed, squawfish, tench, and suckers .

Another introduced fish species, northern pike, has provided a seasonally popular fishery. Ten percent (25,290 h) of the estimated total fishing effort during the 1995-96 survey was for northern pike (Table 2). The northern pike fishery became very popular in 1991 when four state record northern pike weighing over 13.5 kg were harvested. Horner and Davis (1995) reported an estimated fishing effort for northern pike during a 3-week period, March 23, to April 14, 1991, of 14,655 h (Table 18). Fifty-eight percent, 14,777 h, of the 1995-96 fishing effort for northern pike occurred between March 1 to April 30, 1996.

Harvest of northern pike was lower in 1995-96 than during the 3-week survey in 1991, 523 and 672, respectively (Table 19). Had the 1991 survey continued the entire year, northern pike harvest may have been substantially higher than in 1995-96. The apparent decline in harvest of northern pike may be a result of the February, 1996 flood and resulting high, turbid water during the March/April fishery, or the continued popularity of the fishery.

The yellow perch fishery in Coeur d'Alene Lake has declined since Mallet (1968) reported an estimated harvest of 1,810 yellow perch from Coeur d'Alene Lake in 1967. Reiman et al. (1980) reported an estimated harvest of 1,150 yellow perch in 1979. In 1995-94, the estimated annual harvest of yellow perch was only 166. Rich (1992) reported yellow perch comprised 11% and 15% by weight, of northern pike diets in Coeur d'Alene Lake during the spring and fall, respectively.

Westslope cutthroat fishery has been declining since Jeppson (pers. comm. from Mallet (1968) observed a decline of westslope cutthroat trout in the harvest from 40% to 15% over a three year period 1957-1960. Mallet (1968) reported an estimated harvest of 889 cutthroat trout in 1967 and 0.4% of the harvest (Table 19). Reiman et al. (1980) reported an estimated harvest of 595 westslope cutthroat trout, less than one percent of the harvest. In 1995-96 only four westslope cutthroat trout were harvested. The decline in the westslope cutthroat trout fishery may be attributed to habitat degradation, overharvest, and predation and competition. Rich (1992) reported westslope cutthroat trout comprised 13% and 21% of northern pike diets in Coeur d'Alene Lake during the spring and fall respectively. A small westslope cutthroat trout fishery in Coeur d'Alene Lake occurs in May and June along the northern shore of Wolf Lodge Bay and the Coeur d'Alene Parkway. The westslope cutthroat trout fishery is virtually nonexistent in Coeur d'Alene Lake.

Fish Population Characteristics

The estimated population of age-1 and age-2 kokanee in 1996 may be the result of weak year-classes, or may be an artifact of the sampling methodology. Year-classes of age-1 kokanee have appeared low in previous years, only to show up as age-2 fish the following year. Further assessment of the 1994 year-class, combined with estimates of the 1995 and 1996 year-classes, will provide a better basis to determine the effect of the increasing chinook population on kokanee abundance.

Recommendations 1) Continue to target an annual recruitment of 70,000 age-0 chinook through stocking (30,000) and redd control (40,000), and 2) continue to monitor kokanee length-at-age and population size.

Priest Lake and Upper Priest Lake

Hydroacoustic surveys in 1995 and 1996 generated consistent population estimates of lake trout between the two years. Although apparently precise, the accuracy of the method is uncertain. The total population of fish presumed to be lake trout (>330 mm) were around 23,000 in 1995 and 1996, yet lake trout harvest was estimated to be around 14,000 in 1994, suggesting an annual exploitation rate of around 60%. This is almost certainly an overestimate, and indicates that the hydroacoustic surveys underestimate lake trout abundance. An intensive mark-recapture population estimate in a smaller system (perhaps Upper Priest Lake) in combination with hydroacoustic surveys might provide a correction factor for the hydroacoustic surveys that could then be applied to larger systems, where mark-recapture experiments are not feasible.

Success of a slot-limit or minimum length limit is largely dependent on low natural mortality and low hooking mortality of released fish. Artificial swim bladder deflation appears to have potential to reduce hooking mortality. Although we recognize the risk of infection and organ damage, research has demonstrated the potential for artificial swim bladder deflation to increase survival of largemouth bass (Shasteen and Sheehan 1997; Lee 1992) and yellow perch (Keniry et al. 1996) hooked in deep water. Treated fish were able to immediately return to depth, thereby avoiding the negative effects of temperature, predation, and illegal harvest. Shasteen and Sheehan (1997) determined that artificially punctured swim bladders of largemouth bass healed quickly and were functional immediately, and Bruesewitz et al. (1993) reported complete healing of artificially deflated burbot *Lota lota* swim bladders within eight weeks. While our results are as of yet inconclusive, future assessment of tag returns from treated and untreated fish will help evaluate the potential of the procedure.

Recommendations-1) Solicit and compile angler preferences regarding potential management strategies and effects on the fishery (i.e. acceptable mean size, trophy potential, seasonal restrictions, more restrictive bag limits, and slot limits); 2) implement the prefered biologically sound alternative; 3) continue to evaluate the merits of artificial gas bladder deflation using future tag return information; and 4) conduct mark-recapture and hydroacoustic population estimates on Upper Priest Lake to "calibrate" hydroacoustic estimates and to assess the lake trout population in Upper Priest Lake.

Cocolalla Lake

The thermograph results and the consistent lack of reproduction, even when spawning structures were provided, indicates that channel catfish do not have access to sufficiently high water temperatures for a sustained period in early summer to provide significant natural reproduction in Cocolalla Lake. In a system with a similar summertime thermal regime, Patton and Hubert (1996) reported that channel catfish successfully spawned but not until mid to late July. The combination of delayed spawning and sub-optimal water temperatures restricted fry growth to the point where young channel catfish did not survive their first winter. Whether channel catfish are limited by sufficient spawning temperatures or by overwinter fry survival, it seems evident that continued stocking will be necessary to provide a fishery for channel catfish in Cocolalla Lake. Results of a creel survey and trout stocking evaluation of Cocolalla Lake in 1992 demonstrated that Cocolalla

Lake is unsuitable to provide an efficient put and take trout fishery (Horner et. al 1996), whereas channel catfish have created a popular fishery and provided regional diversity.

Recommendation-Continue stocking channel catfish in Cocolalla Lake.

Bonner Lake

Most of the total fish biomass in Bonner Lake is comprised of fish contributing little to the fishery. Very few largemouth bass sampled were of harvestable size (3%), and pumpkinseeds were generally too small to provide a fishery. The relatively slow growth rates of largemouth bass in Bonner Lake, combined with natural mortality and/or illegal harvest, limit the potential of the lake to provide a high quality bass fishery.

The size and species composition of Bonner Lake make it a good candidate for renovation with rotenone and implementation of quality trout regulations; however, the success of such a program would be dependent on angler support and compliance with the regulations.

Recommendations-1) Evaluate angler support for Bonner Lake renovation, and if supported, obtain Commission approval for a salvage fishery; 2) eradicate fish in the fall of 1997; and 3) implement quality trout regulations in 1998.

Bloom Lake

Currently, brook trout in Bloom Lake grow too slowly, and are too short-lived to provide a quality (14 inch minimum) fishery. Pumpkinseeds comprise a major component of the biomass (35%) and likely reduce the available forage for brook trout. Renovation, combined with stocking of rainbow trout and/or cutthroat trout would likely be successful in eliminating pumpkinseeds and should result in rapid growth of trout; however, the potential to produce large numbers of "quality" trout may be limited by the volume of suitable habitat (< 20°C and > 5 mg/L DO) in mid to late summer (e.g. less than 6% in July).

The Bloom Lake fishery might also be improved without renovation, simply by reducing stocking rates of brook trout. Growth estimates from Bloom Lake could be characterized as typical of brook trout throughout their range (Carlander 1969). However, growth is highly variable and the potential for faster growth should not be discounted. The rapid decline of W_r in larger fish suggests food may limit growth of the two and three year old brook trout. Stocking rates from 1992 through 1995 have been around 5,000 fingerlings per year, or 543/ha. Low population densities (i.e. 50-100/ha; McAfee 1966) are generally considered to be a key factor in brook trout growth (Scott and Crossman 1973; Carlander 1969). Increased growth would probably not be sufficient to warrant a quality fishery with a 12 or 14 inch minimum because of the limited longevity of brook trout in Bloom Lake. Although we have no information to partition mortality into natural and harvest components, it seems unlikely that the very limited number of age-3 and the total lack of age-4 fish is a result of angler exploitation. Brook trout typically are short-lived fish, usually not exceeding four years of age (McAfee 1966; Carlander 1969), and often not exceeding two or three (McAfee 1966). The limited period of boat access to Bloom Lake suggests that angler exploitation, although possibly significant, is not limiting the number of quality size fish.

Recommendation-1) Do not attempt to manage Bloom Lake as a "Quality Trout" fishery at this time; 2) decrease annual stocking to 1,000 brook trout from 1996 through 1998; 3) evaluate Bloom Lake in 1998 to determine if low densities improve brook trout growth rates, and if lake renovation is necessary to eliminate competition from pumpkinseeds and increase brook trout growth.

Anderson Lake and Blue Lake

Historically, annual recruitment to the lateral lakes has been variable. Spawning success and first year survival are at least partially related to the cool temperatures and variable water levels associated with the adjacent Coeur d'Alene River (Horner et al. In press, Rieman 1987). Research throughout Idaho has shown that recruitment is limited in many systems by year-to-year variation in spring weather (Dillon 1992; Bennett et al. 1991). In such systems, intraspecific competition is generally not influential enough to cause reduced growth and lead to stockpiling of undersized fish (Dillon 1992), and, therefore, minimum length limits can be an effective management tool for largemouth bass. Blue Lake, which allows harvest of only large fish, is an example of the effectiveness of a minimum length strategy. Despite inconsistent recruitment, Blue Lake has an abundance of quality and trophy size fish, and stock assessment indices (PSD=91, RSD-P=55) are appropriate given the management objective of a trophy largemouth bass fishery (Willis et al. 1993).

In Anderson Lake, we did not see any evidence of high density of small (age-1 to age-5) largemouth bass that would lead to intraspecific competition. To the contrary, we saw evidence of weak age classes (age-4 and age-5) in Anderson Lake in both 1990 (Horner et al. In press) and 1996, suggesting that recruitment may limit the population. In largemouth bass populations in Idaho characterized by minimal recruitment, slot-limits may not be appropriate (Dillon 1992). Such regulations are designed to provide a yield fishery for smaller fish, while retaining the potential for trophy class fish by reducing numbers of small fish and minimizing intraspecific competition. Systems with variable or limited recruitment may not by able to withstand a yield fishery on small fish. For this reason, a minimum length limit may be more appropriate for Anderson Lake. Unfortunately, we did not collect a large enough sample of largemouth bass in Anderson Lake to definitively compare size structure in 1996 to 1990, when a 14 inch minimum size was in effect. The PSD declined from 83 to 56; however, the small sample size in 1996 limits the value of this comparison as well.

Recommendations-1) Assess angler preferences for size structure and harvest opportunity of largemouth bass in the Anderson Lake, Blue Lake, and other lateral lakes, and 2) if widely accepted, implement minimum length limits throughout the lateral lake system.

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APPENDICES

Appendix A. Comparison of kokanee catch by age class with and without the use of spreader bars on the trawl net Coeur d'Alene Lake, Idaho.

t-Test: Paired Two Sample for Means

	NO-BARS	BARS
	6482	655
	2493	1070
AGE 0	650	984
	791	664
	981	1881
	608	4409
	606	1691
	53	0
	0	0
AGE 1	0	0
	18	0
	17	0
	35	23
	0	11
	89	46
	87	23
AGE 2	18	90
	35	0
	69	183
	69	183
	35	23
	231	287
	225	57
	193	68
AGE 3	35	34
	155	160
	17	332
	87	318
MEAN	502.82	471.14

AGE O

	Variable 1	*Variable 2*
Mean	1801.57143	1622
Variance	4709866.29	1733968.67
Observations	7	7
Pearson Correlation	-0.39811672	
Hypothesized Mean Difference	0	
df	6	
t Stat	0.16089631	
P(T<=t) one-tail	0.43872789	
t Critical one-tail	1.94318091	
P(T<=t) two-tail	0.87745578	
t Critical two-tail	2.44691364	

AGE 2

	Variable 1	*Variable 2*
Mean	57.4285714	78.2857143
Variance	783.285714	5891.90476
Observations	7	7
Pearson Correlation	0.17868235	
Hypothesized Mean Difference	0	
df	6	
t Stat	-0.71796429	
P(T<=t) one-tail	0.2498835	
t Critical one-tail	1.94318091	
P(T<=t) two-tail	0.49976701	
t Critical two-tail	2.44691364	

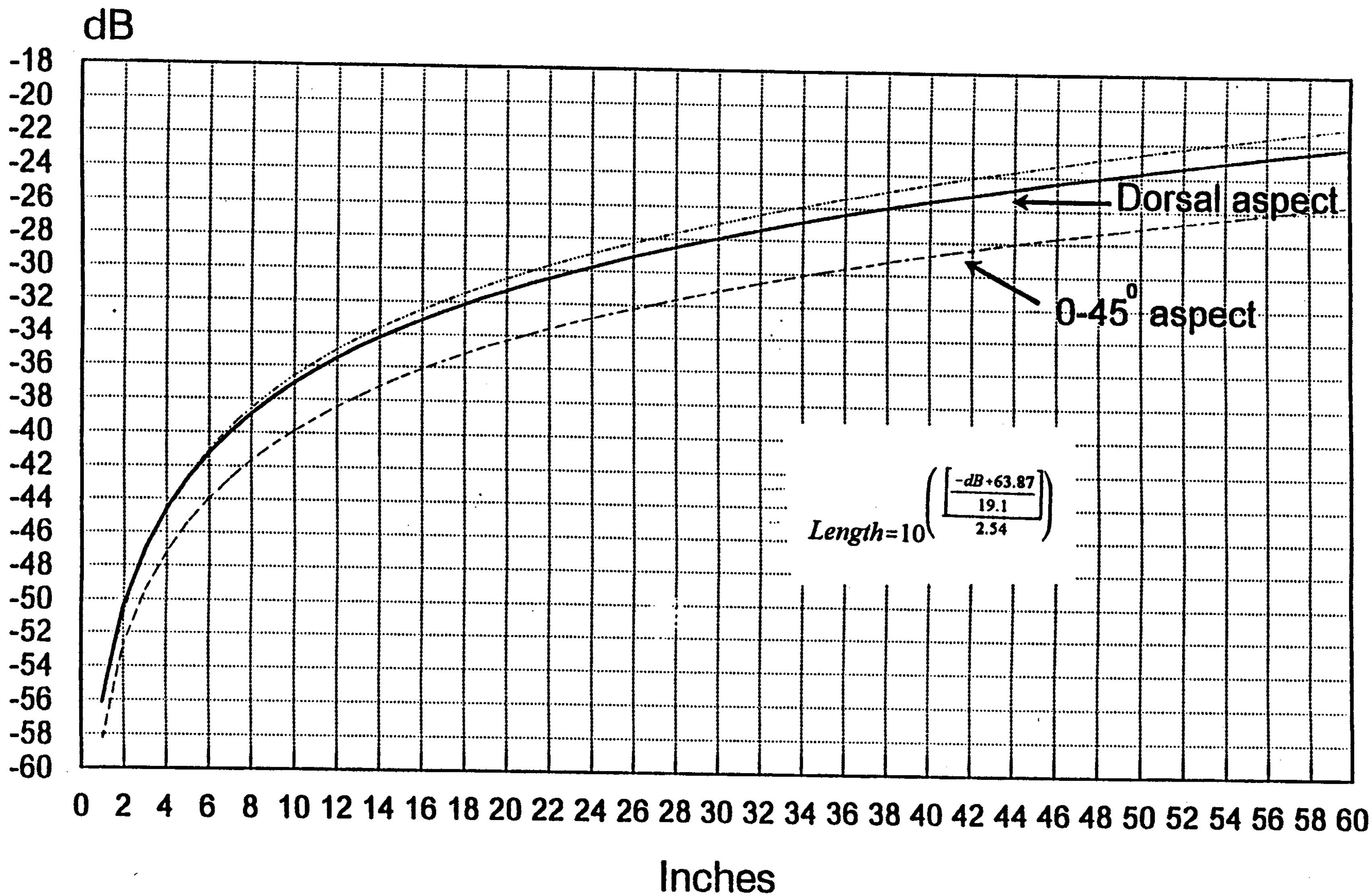
AGE 1

	Variable 1	*Variable 2*
Mean	17.5714286	4.85714286
Variance	414.285714	80.8095238
Observations	7	7
Pearson Correlation	0.18907542	
Hypothesized Mean Difference	0	
df	6	
t Stat	1.62998924	
P(T<=t) one-tail	0.07711298	
t Critical one-tail	1.94318091	
P(T<=t) two-tail	0.15422598	
t Critical two-tail	2.44691364	

AGE 3

	Variable 1	*Variable 2*
Mean	134.714286	179.428571
Variance	7884.57143	17163.9524
Observations	7	7
Pearson Correlation	-0.25294278	
Hypothesized Mean Difference	0	
df	6	
t Stat	-0.67263628	
P(T<=t) one-tail	0.26311042	
t Critical one-tail	1.94318091	
P(T<=t) two-tail	0.52622085	
t Critical two-tail	2.44691364	

Appendix B. Relationship of dB strength to fish length used to estimate fish size during the Priest Lake and Upper Priest Lake, Idaho, hydroacoustic surveys. The dorsal aspect, used for the surveys, is represented by the equation.



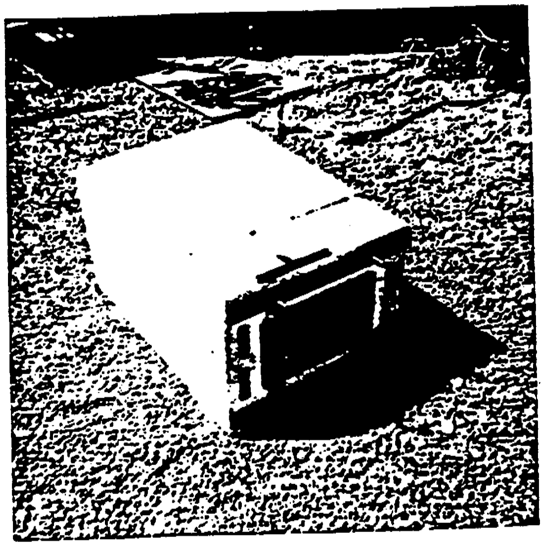
Appendix C. Latitude and longitude of waypoints used to define transects during the Priest Lake and Upper Priest Lake, Idaho, hydroacoustic surveys.

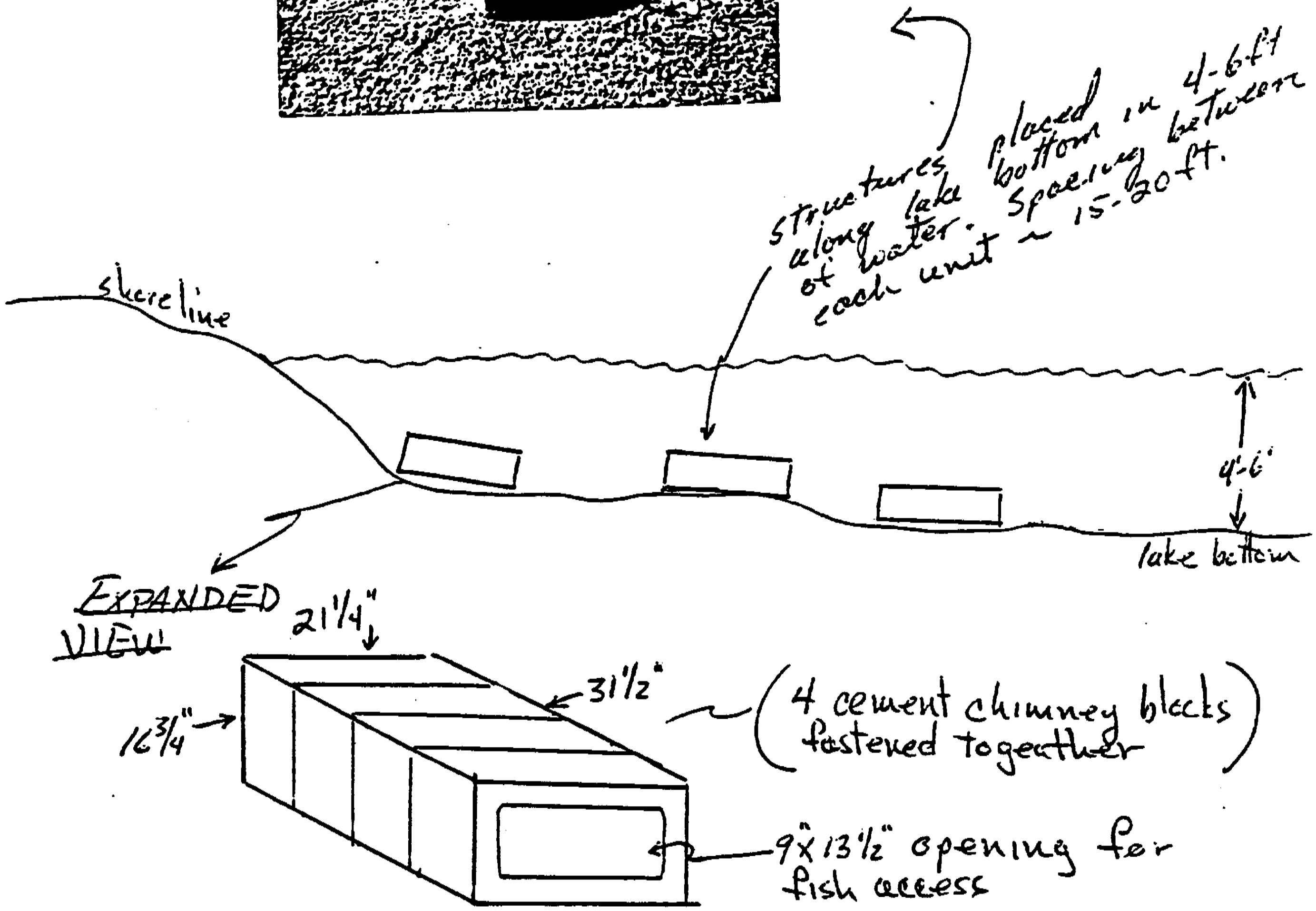
Way Point No.	Way Point Location	Latitude/Longitude
1	Bishop's Marina - Coolin	N48°28.839'/W116°51.091'
2	Pt. S.E. of Outlet Bay	N48°29.539'/W116°52.391'
3	Outlet Bay Marina	N48°29.663'/W116°53.376'
4	Mouth of Soldier Creek	N48°30.192'/W116°50.346'
5	Osprey Campground	N48°30.328'/W116°53.249'
6	Hess Pt.	N48°31.344'/W116°51.173'
7	Pt. S. of Shoshone Bay	N48°31.534'/W116°53.280'
8	Four Mile Island white nav-light	N48°31.701'/W116°51.588'
9	Pt. N. of Shoshone Bay	N48°32.089'/W116°53.652'
10	Cavanaugh Bay Marina	N48°31.441'/W116°49.466'
11	Blue Diamond Marina	N48°31.940'/W116°50.050
12	Rocky Point, nav-light	N48°32.381'/W116°50.305'
13	Pt. W. of Rocky Point	N48°32.391'/W116°50.780'
14	Pt. S. of the N. Bartoo white nav-light	N48°32.832'/W116°51.922'
15	N. Bartoo white nav-light	N48°33.192'/W116°51.800'
16	S.W. Bartoo white nav-light	N48°32.626'/W116°53.155'
17	Hill's Resort, Luby Bay	N48°32.313'/W116°55.227'
18	Kalispell Point USFS boat Launch	N48°33.608'/W116°55.545'
19	Papoose Island	N48°33.362'/W116°53.518'
20	Three Pines Campground - E. Kalispel Island	N48°33.947'/W116°53.607'
21	Mouth of Hunt Creek	N48°33.762'/W116°49.828'
22	Eightmile Island red nav-light	N48°34.774'/W116°51.014'
23	Indian Rock white nav-light	N48°34.775'/W116°53.922'
24	Woody's Roost	N48°36.066'/W116°51.660'
25	Pinto Point	N48°36.172'/W116°50.777'
26	Mouth of Indian Creek	N48°36.614'/W116°50.206'
27	Nav-light, 1 mi S. Reeder Bay	N48°36.193'/W116°53.223'
28	Cape Horn red nav-light	N48°36.885'/W116°52.427'

Appendix C (Cont'd).

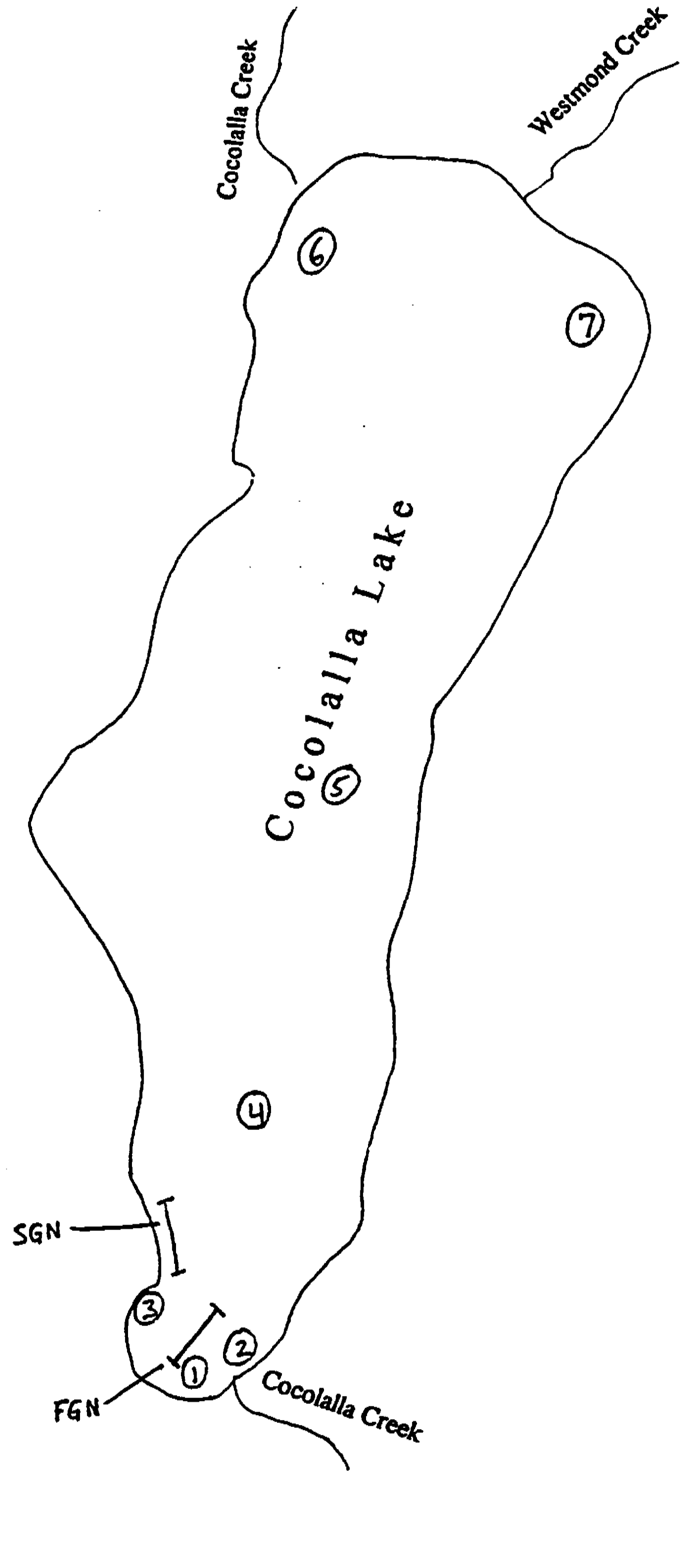
Way Point No.	Way Point Location	Latitude/Longitude
29	Elkins Resort, Reeder Bay	N48°37.331'/W116°53.654'
30	Pt. S. of Bear Creek	N48°37.976'/W116°51.301'
31	Kaniksu Resort	N48°38.025'/W116°51.868'
32	Mouth of Granite Creek	N48°38.383'/W116°51.833'
33	West Twin Island green nav-light	N48°39.911'/W116°51.982'
34	East Twin Island red nav-light	N48°39.874'/W116°50.917'
35	Mouth of Two Mouth Creek	N48°41.240'/W116°50.190'
36	Pt. N. of Distillery Bay	N48°41.576'/W116°52.007'
37	Pt. S. of Teacher Bay	N48°42.396'/W116°51.397'
38	Barbieri's Cabin	N48°42.161'/W116°50.585'
39	Tripod Point	N48°43.128'/W116°51.202'
40	Canoe Point	N48°43.265'/W116°50.261'
41	Squaw Bay boat dock	N48°44.004'/W116°49.520'
42	Mouth of Lion Creek	N48°44.115'/W116°49.947'
43	Lion Head boat launch	N48°44.550'/W116°50.056'
44	Thorofair entrance white nav-light	N48°44.372'/W116°50.567'
45	Upper Priest Lake outlet	N48°45.936'/W116°51.902'
46	Rock island	N48°46.339'/W116°52.018'
47	Plowboy Campground	N48°46.215'/W116°52.847'
48	Point - 1.0 mi S.E. 50	N48°46.759'/W116°52.616'
49	Pt. - 1.5 mi N.W. of 47	N48°47.010'/W116°53.837'
50	Bay - 0.5 mi S.E. 52	N48°47.390'/W116°52.760'
51	Navigation Campground	N48°47.641'/W116°54.430'
52	Rock point - 0.5 mi S.E. Trapper	N48°47.540'/W116°53.383'
53	Mouth Trapper Creek	N48°47.712'/W116°53.827'
54	Mouth Upper Priest River	N48°47.922'/W116°54.563'

Appendix D. Description of the experimental cement chimney block structures and their placement in Cocolalla Lake, Idaho, to provide channel catfish spawning habitat.





Appendix E. Locations of dissolved oxygen test sites (1-7) and the floating (FGN) and sinking (SGN) gillnet sites during the fish kill assessment in Cocolalla Lake, Idaho, 1996.



Appendix F. Summary of creel survey estimates for fish species harvested and caught by month by section by day type for Coeur d'Alene Lake, Idaho, July 1, 1995 to June 30, 1996.

			Chinook		Kokanee		Largemouth bass		Smallmouth bass		Westslope cutthroat		Northern pike		Black crappie		Brown bullhead		Yellow perch		Other	
Mo	Sec	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
July	1	WE	66	77	1974	2,107	11	99	0	132	0	0	77	88	0	0	0	0	0	0	99	99
		WD	0	0	440	440	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	66	77	2414	2547	11	99	0	132	0	0	77	88	0	0	0	0	0	0	99	99
	2	WE	54	54	3380	3380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	54	54	3380	3380	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	WE	14	27	3339	3407	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	2570	2570	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	14	27	5909	5977	0	68	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug	1	WE	77	141	398	398	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	200	300	4625	4823	67	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	277	441	5023	5221	67	67	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	WE	35	52	162	162	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	59	59	253	253	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	94	111	415	415	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	WE	109	219	1010	1010	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0
		WD	139	276	651	651	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	248	495	1661	1661	0	0	0	0	0	0	0	0	0	0	0	14	0	0	0	0
Sept	1	WE	36	54	5497	5509	0	145	0	19	0	0	108	145	0	0	0	0	108	847	19	19
		WD	0	0	10857	10857	0	195	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	36	54	16354	16366	0	340	0	19	0	0	108	145	0	0	0	0	108	847	19	19

Appendix F. Continued.

			Chinook		Kokanee		Largemouth bass		Smallmouth bass		Westslope cutthroat		Northern pike		Black crappie		Brown bullhead		Yellow perch		Other	
Mo	Sec	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	2	WE	0	0	6252	6252	0	17	0	0	0	17	0	17	0	17	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	6252	6252	0	17	0	0	0	17	0	17	0	17	0	0	0	0	0	0
	3	WE	0	0	8150	8150	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	0
		WD	0	0	8088	8088	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	16238	16238	0	0	0	0	0	0	0	32	0	0	0	0	0	0	0	0
Oct	1	WE	65	195	6561	6561	0	0	0	0	0	0	130	211	0	0	0	0	0	0	0	0
		WD	0	0	5528	5528	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	65	195	12089	12089	0	0	0	0	0	0	130	211	0	0	0	0	0	0	0	0
	2	WE	44	74	1237	1237	0	0	0	0	0	0	15	44	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	44	74	1237	1237	0	0	0	0	0	0	15	44	0	0	0	0	0	0	0	0
	3	WE	0	0	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	63	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Nov	1	WE	183	402	853	853	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	338	582	0	563	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	521	984	853	1416	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	27	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	27	27	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0

Appendix F. Continued.

			Chinook		Kokanee		Largemouth bass		Smallmouth bass		Westslope cutthroat		Northern pike		Black crappie		Brown bullhead		Yellow perch		Other	
Mo	Sec	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	3	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dec	1	WE	164	276	413	473	0	0	0	0	4	12	0	0	0	0	0	0	0	4	0	0
		WD	36	36	286	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	200	312	699	1473	0	0	0	0	4	12	0	0	0	0	0	0	0	4	0	0
	2	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jan	1	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix F. Continued.

Mo	Sec	Day type	Chinook H	Chinook C	Kokanee H	Kokanee C	Largemouth bass H	Largemouth bass C	Smallmouth bass H	Smallmouth bass C	Westslope cutthroat H	Westslope cutthroat C	Northern pike H	Northern pike C	Black crappie H	Black crappie C	Brown bullhead H	Brown bullhead C	Yellow perch H	Yellow perch C	Other H	Other C
Feb	1	WE	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	20	20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mar	1	WE	58	65	0	6	0	12	0	0	0	0	23	23	0	0	6	6	0	0	0	0
		WD	81	81	0	0	0	0	0	0	0	0	20	20	0	0	0	0	0	0	0	0
		Tot	139	146	0	6	0	12	0	0	0	0	43	43	0	0	6	6	0	0	0	0
	2	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apr	1	WE	112	122	0	0	0	0	0	0	0	0	31	31	0	0	0	41	0	0	21	21
		WD	0	18	0	0	0	0	0	0	0	0	54	54	0	0	0	0	0	0	0	0
		Tot	112	122	0	0	0	0	0	0	0	0	85	85	0	0	0	41	0	0	21	21

Appendix F. Continued.

			Chinook		Kokanee		Largemouth bass		Smallmouth bass		Westslope cutthroat		Northern pike		Black crappie		Brown bullhead		Yellow perch		Other	
Mo	Sec	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	2	WE	32	48	11	11	0	0	0	0	0	0	8	8	0	0	0	0	0	0	22	22
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	32	48	11	11	0	0	0	0	0	0	8	8	0	0	0	0	0	0	22	22
	3	WE	83	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	83	103	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	1	WE	261	301	19	19	0	58	0	39	0	10	57	67	0	0	619	629	58	58	0	0
		WD	553	628	50	50	0	226	0	75	0	0	0	0	0	0	0	0	0	0	0	25
		Tot	814	929	69	69	0	284	0	114	0	10	57	67	0	0	619	629	58	58	0	25
	2	WE	0	0	28	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	28	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3	WE	0	0	0	0	130	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	0	0	130	149	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	1	WE	210	219	897	13	147	0	107	0	0	0	0	13	27	108	0	0	0	0	0	27
		WD	146	146	3203	364	29	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	356	365	4100	377	176	29	107	0	0	0	0	13	27	108	0	0	0	0	0	27
	2	WE	120	180	1138	1138	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		WD	0	0	2948	2948	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	120	180	4086	4086	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix F. Continued.

			Chinook		Kokanee		Largemouth bass		Smallmouth bass		Westslope cutthroat		Northern pike		Black crappie		Brown bullhead		Yellow perch		Other	
Mo	Sec	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	3	WE	0	0	10445	10445	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0
		WD	0	0	2118	2118	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		Tot	0	0	12563	12563	0	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0
Total		WE	1734	2629	51764	52106	154	695	0	165	4	51	449	679	27	205	625	690	166	909	168	202
		WD	1579	2174	41617	43500	96	517	0	75	0	0	74	74	0	0	0	0	0	0	0	25
		Tot	3303	4803	93381	95606	250	1212	0	240	4	51	523	753	27	205	625	690	166	909	168	227

Appendix G. Summary of creel survey estimates for fish harvested (H) and caught (C) by species, by month and day type for Chatcolet Lake, Idaho, July 1, 1995 to June 30, 1996.

		Largemouth bass		Northern pike		Black crappie		Yellow perch		Channel catfish		Brown bullhead		Westslope cutthroat		Kokanee		Rainbow trout		Other	
Month	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
July	WE	45	225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	45	225	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1546	1546	0	0	0	0
	WD	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	32	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sept	WE	12	415	12	23	23	23	219	369	12	12	0	0	0	12	34	34	0	0	23	23
	WD	0	480	0	0	0	0	443	443	0	0	0	0	0	0	0	0	0	0	0	185
	TOT	0	895	12	23	23	23	662	812	12	12	0	0	0	12	34	34	0	0	23	208
Oct	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	256	0	0	0	0	512	512	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	256	0	0	0	0	512	512	0	0	0	0	0	0	0	0	0	0	0	0
November to February	No effort																				
Mar	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apr	WE	17	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
May	WE	37	147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix G. Continued.

		Largemouth bass		Northern pike		Black crappie		Yellow perch		Channel catfish		Brown bullhead		Westslope cutthroat		Kokanee		Rainbow trout		Other	
Month	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	WE	0	569	114	114	569	910	170	4152	0	57	0	0	0	0	0	0	0	0	0	284
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	569	114	114	569	910	170	4152	0	57	0	0	0	0	0	0	0	0	0	284
Total	WE	111	1373	126	137	592	933	901	5033	12	12	0	57	0	12	1598	1598	0	0	23	341
	WD	0	768	0	0	0	0	443	443	0	0	0	0	0	0	0	0	0	0	0	185
	TOT	111	2141	126	137	592	933	1341	5476	12	12	0	57	0	12	1598	1598	0	0	23	526

Appendix H. Summary of creel survey estimates for fish harvested (H) and caught (C) by species, by month and day type for Benewah Lake, Idaho, July1, 1995 to June 30, 1996.

		Largemouth bass		Northern pike		Black crappie		Yellow perch		Channel catfish		Brown bullhead		Westslope cutthroat		Kokanee		Rainbow trout		Other	
Month	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
July	WE	0	178	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	0	231
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	178	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	8	0	231
Aug	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sept	WE	0	130	0	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	130	0	15	0	0	0	15	0	0	0	0	0	0	0	0	0	0	0	0
Oct	WE	0	0	0	0	97	414	0	0	0	0	0	0	0	0	0	0	0	0	0	14
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	97	414	0	0	0	0	0	0	0	0	0	0	0	0	0	14
November to February		No effort																			
Mar	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apr	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	23
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	WE	104	104	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix H. Continued.

		Largemouth bass		Northern pike		Black crappie		Yellow perch		Channel catfish		Brown bullhead		Westslope cutthroat		Kokanee		Rainbow trout		Other	
Month	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	TOT	104	104	0	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	WE	0	0	0	0	1074	1563	0	537	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	1074	1563	0	537	0	0	0	0	0	0	0	0	0	0	0	0
Total	WE	104	412	0	32	1171	1917	0	552	0	0	0	8	0	0	0	0	0	8	0	245
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	104	412	0	32	1171	1917	0	552	0	0	0	8	0	0	0	0	0	8	0	245

Appendix I. Summary of creel survey estimates for fish harvested (H) and caught (C) by species, by month and day type for Round Lake (Benewah County), Idaho, July 1,1995 to June 30, 1996.

		Largemouth bass		Northern pike		Black crappie		Yellow perch		Channel catfish		Brown bullhead		Westslope cutthroat		Kokanee		Rainbow trout		Other	
Month	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
July	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aug	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sept	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Oct	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
November to February	No effort																				
Mar	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Apr	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
May	WE	12	15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix I. Continued.

		Largemouth bass		Northern pike		Black crappie		Yellow perch		Channel catfish		Brown bullhead		Westslope cutthroat		Kokanee		Rainbow trout		Other	
Month	Day type	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	TOT	12	15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
June	WE	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	WE	12	15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	WD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TOT	12	15	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix J. Summary of angler effort and success in Idaho Panhandle Regional lakes based on the impromptu officer creel survey.

Lake	Month	# days surv.	no. interviews	resident	non-resident	Anglers	Hours	Fish Type	Equipment	Harvest	Release
Anderson	Mar	2	6	8	0	8	6	none	bank	0	0
	Apr	1	6	2	0	2	6	none	bank	0	0
Benewah	Mar	2	7	7	0	7	7	CRP:5 YP:2 LMB:2	boat:2, bank:5	9	0
Bloom	Jun	1	0	n/a	n/a	1	1	none	boat	0	0
Blue (Bonner C)	Feb	1	3	3	0	3	7	YP:13	ice	13	0
	Mar	1	0	0	0	0	0	0	0	0	0
Bonner	Jun	2	4	4	0	4	2	RBT:2	boat	2	0
Brush	Apr	2	8	8	0	8	10	RBT:16, Splake:2	boat:4, bank:4	18	0
	May	1	2	2	0	2	4	0	bank	0	0
	Jul	1	21	19	2	21	30	RBT:7	boat:6, bank:15	7	0
Cave	May	1	5	5	0	5	14	CRP:25, BC:24	bank	49	0
Chase	Feb	1	2	2	0	2	6	0	ice	0	0
	Mar	0	0	0	0	0	0	0	0	0	0
Chatcolet	Apr	2	4	4	0	4	4	NP:0	bank	0	0
	Jun	1	5	n/a	n/a	5	5	0	ftube:1, bank:4	0	0
Cocolalla	Feb	3	10	10	0	12	12	YP:125	ice:12	125	0
	Mar	1	3	3	0	3	7	BKT:1	bank	1	0
	Apr	2	0	n/a	n/a	1	n/a	0	n/a	0	0
	May	1	0	n/a	n/a	4	n/a	0	boat	0	0
	Jul	1	0	0	0	0	0	0	0	0	0
Cocolalla Sl	Apr	2	7	5	2	7	9	YP:8	bank	8	YP

Appendix J (Cont'd). Officer creel survey summary.

Lake	Month	# days surv.	no. interviews	resident	non-resident	Anglers	Hours	Fish Type	Equipment	Harvest	Release
	May	1	3	2	1	9	15	LMB:1	n/a	1	0
	Jun	1	0	n/a	n/a	2	2	0	bank	0	0
	Jul	1	4	4	0	4	3	0	n/a	0	0
<u>Coeur d'Alene</u>	Mar	1	3	3	0	3	13	0	bank	0	0
	Apr	3	47	39	8	47	184.5	0	boat:26, bank:21	0	0
	Jun	2	34	26	8	39	73.75	CHK:2, KOK:11	boat:34, bank:5	13	0
	Jul	3	95	62	33	95	128.5	KOK:105 CHK:16, SMB:14	boat:91, bank:4	133	CHK:1 SMB:1
<u>Cooks</u>	Jul	1	3	3	0	3	n/a	0	bank	0	0
<u>Dawson</u>	Feb	2	9	9	0	9	12	0	ice	0	0
	Jul	2	7	7	0	7	6	LMB:1	boat	1	0
<u>Dennick</u>	Jun	1	2	n/a	n/a	2	1	CT:2	bank	2	0
<u>Denton Sl</u>	Jun	1	4	4	0	4	8	0	bank	0	0
<u>Fernan</u>	Apr	2	38	36	2	38	46.5	CRP:85, YP:9 LMB:1, RBT:21	bank	116	0
	May	1	4	3	1	4	6.5	RBT:2, Tench:1	bank	3	0
	Jun	2	15	15	0	15	18	LMB:3, RBT:6, CRP:10	bank	CRP:10 RBT:1	LMB:1 RBT:5
<u>Gamble</u>	Aug	1	3	3	0	3	n/a	0	bank	0	0
<u>Granite</u>	Apr	1	0	0	0	0	0	0	0	0	0
	Jul	4	1	1	0	1	n/a	LMB	boat	0	LMB
	Aug	2	0	0	0	0	0	0	0	0	0

Appendix J (Cont'd). Officer creel survey summary.

Lake	Month	# days surv.	no. interviews	resident	non-resident	Anglers	Hours	Fish Type	Equipment	Harvest	Release
	Sep	1	0	0	0	0	0	0	0	0	0
Hauser	Feb	1	7	7	0	7	10.5	YP:18	ice	18	0
	Apr	1	28	18	10	50	46	RBT:17	boat:18, bank:10	17	0
	May	2	12	9	3	12	20.5	RBT:1	bank	1	0
	Jul	3	16	15	1	16	40	RBT:14, PS:2	bank	16	0
Hayden	Jan	10	46	43	3	69	192	NP:44	ice	44	0
	Mar	1	3	3	0	3	2.5	0	boat:2, bank:1	0	0
	Apr	2	2	2	0	2	2.25	CT:2	bank	2	0
	May	4	98	87	11	98	204	CT:4, RBT:2 LMB:24, CRP:5, YP:6	bank:46, boat:52	38	LMB:2 CRP:1
	Jun	2	82	65	17	82	132.5	LMB:30, SMB:10 YP:19, CRP:45	boat:43, bank:39	101	SMB:3
	Jul	1	18	13	5	18	39	LMB:1, CRP:1	boat:10, bank:8	1	LMB:1
Herman	Feb	1	4	4	0	4	6	0	ice	0	0
	Mar	1	1	1	0	1	2	YP:10	ice	10	0
Hidden	Jul	1	0	0	0	0	0	0	0	0	0
Jewel	Apr	1	12	11	1	12	27.75	RBT:19, CT:2, YP:11	boat:4, ftube:8	32	0
	May	3	9	7	2	15	20	CT:15+, YP:160	boat	YP:60	CT:15+ YP:100
	Jun	1	9	n/a	n/a	9	6	CT:8	boat	0	CT:8
	Jul	1	11	11	0	11	18	RBT:3, CT:16, YP:30	boat:9, bank:2	YP:30	CT:13
	Aug	1	4	4	0	4	6	CT	ftube:4	0	CT:?

Appendix J (Cont'd). Officer creel survey summary.

Lake	Month	# days surv.	no. interviews	resident	non-resident	Anglers	Hours	Fish Type	Equipment	Harvest	Release
Johnson	Jun	4	11	11	0	11	19	SQ:4, CT:2	boat:, bank:6	6	0
	Jul	3	23	5	18	25	95	KOK:135, RBT:1	boat:25	136	0
	Aug	1	14	5	9	14	73	KOK:165, CT:1 Crayfish:4	boat, bank	170	0
	Sep	1	7	7	0	7	10	YP:30	n/a	30	0
Kelso	Apr	4	28	25	3	28	70	RBT:20	bank	20	0
	Jun	1	7	7	0	12	20	RBT:7	bank	7	0
	Jul	1	2	2	0	2	5	0	bank	0	0
	Aug	1	3	3	0	7	5	0	bank	0	0
L.P. Slough	Apr	2	7	7	0	11	11	BC:1, RBT:7	boat:2, bank:5	8	0
Medicine	Mar	1	2	2	0	2	n/a	0	bank	0	0
	May	1	3	3	0	3	10	LMB:3, BC:16 CRP:13	boat:1, bank:2	32	0
Mirror	Jul	1	3	3	0	3	n/a	0	bank	0	0
Morton Sl	Apr	1	0	0	0	0	0	0	0	0	0
	Jul	1	3	3	0	3	4	CRP:20	n/a	20	0
Pend Oreille	Mar	2	21	17	4	21	70	LKT:6	boat	6	0
	Apr	9	461	312	149	461	2855	RBT:1, CT:1, SQ:2, WHF:3, LKT:37	boat	44	0
	May	4	499	337	162	499	3140	RBT:23, BLT:2, SQ:23 LKT:18, BRN:1	boat	RBT:5 LKT:9 SQ:21	RB:18 LKT:9 BLT:2 BRN:1

Appendix J (Cont'd). Officer creel survey summary.

Lake	Month	# days surv.	no. interviews	resident	non-resident	Anglers	Hours	Fish Type	Equipment	Harvest	Release
	Jun	5	142	101	41	142	323	KOK:51, RBT:2, LKT:2 SQ:6, BC:5	boat:32+, bank:?	60	BC:5 RBT:1
	Jul	8	219	94	125	219	666	KOK:196 , YP:9, RBT:1, CT:5 , LKT:2, SQ:8	boat:90+, bank:?	221	0
	Aug	7	142	48	94	142	514	KOK:19, RBT:2, YP:3, SQ:27	boat:51+, bank:?	51	0
	Sep	2	77	30	47	77	361	KOK:92, LKT:5, RBT:2, CT:1	boat	100	0
	Oct	1	48	30	18	48	210	KOK:15, BRT:1	boat:?, bank:?	16	0
	Nov	1	67	49	18	67	440	RBT:2, CT:3, BRT:1	boat	6	0
Pend Oreille Sh.	Mar	12	80	80	0	80	176	CT:3 Cutbow:1	boat:?, bank:65+	4	0
	Apr	10	113	99	14	113	338	CT:1, YP:5, BC:57	boat:?, bank:57+	63	0
	Jun	12	106	79	27	106	149	LMB:2, CT:6, SQ:5 Peamouth:9	boat:2, bank:104	52	0
	Jul	13	6	4	2	6	7	0	bank	0	0
	Aug	2	2	2	0	2	3	0	bank	0	0
Perkins	Feb	2	3	3	0	3	0	0	ice	0	0
	Mar	1	0	0	0	0	0	0	0	0	0
	May	1	4	4	0	4	0	0	boat	0	0
	Jun	1	0	0	0	0	0	0	0	0	0
	Jul	3	6	6	0	6	4	0	boat:2, bank:4	0	0

Appendix J (Cont'd). Officer creel survey summary.

Lake	Month	# days surv.	no. interviews	resident	non-resident	Anglers	Hours	Fish Type	Equipment	Harvest	Release
Porcupine	Aug	1	2	2	0	2	3	0	bank	0	0
Priest	Feb	3	37	35	2	37	87	LKT:10	ice	10	0
	Mar	1	17	8	9	17	24	LKT:3	ice	3	0
	Apr	1	5	3	2	5	26	LKT:6	n/a	6	0
	May	4	6	4	2	22	13	LKT:1, BRT:1	boat	1	BRT:1
	Jun	3	46	17	29	46	97.5	CT:1, LKT:21	boat	17	LKT:4 CT:1
	Jul	3	58	17	41	58	100	RBT:10, LKT:23	boat:56, bank:2	23	RBT:10
Robinson	Apr	1	5	5	0	5	10	RBT:9	boat:1, bank:4	9	0
	Jul	2	29	26	3	29	41	RBT:30	boat:11, bank:18	30	0
Roman N #1	Jul	1	13	10	3	13	21	BKT:6	boat:6, bank:7	6	0
Round (Bonner C)	Jan	1	5	1	4	5	7	YP:3	ice	3	0
	Mar	1	3	3	0	3	2	RBT:1	bank	1	0
	Apr	1	7	6	1	7	12	RBT:8	boat:3, bank:4	8	0
	May	2	99	82	17	106	179	RBT:1, BC:1	boat:?, bank:14+	2	0
	Jun	2	24	16	8	25	46	LMB:1, YP:8, PS:1	boat:3, bank:21	3	LMB:1
	Jul	2	8	7	1	25	48	RBT:4, YP:2, CRP:1	boat:1, bank:11	7	0
	Aug	1	9	7	2	14	n/a	LMB:1	bank	0	1
Sinclair	May	1	1	1	0	1	2	0	boat	0	0
	Jul	2	3	3	0	3	1	0	n/a	0	0
Smith	Feb	2	0	0	0	0	0	0	0	0	0

Appendix J (Cont'd). Officer creel survey summary.

Lake	Month	# days surv.	no. interviews	resident	non-resident	Anglers	Hours	Fish Type	Equipment	Harvest	Release
	Apr	2	5	5	0	5	6	KOK:1	boat:4, bank:1	1	0
	May	3	35	32	3	35	42	RBT:1	boat:20, bank:15	1	0
	Jul	1	8	6	2	8	12	RBT:4	boat:2, bank:6	4	0
Solomon	May	1	5	5	0	5	5	0	boat:3, bank:2	0	0
	Jun	1	4	3	1	4	10	RBT:7	boat	0	7
	Jul	3	18	14	4	18	12	0	boat:9, bank:9	0	0
Spirit	Apr	4	13	13	0	17	16	BC:168, LMB:1, YP:5, PS:2	bank	176	0
	May	1	2	2	0	20	10	KOK:9	n/a	9	0
	Jul	1	0	0	0	2	0	0	boat	0	0
Thompson	Mar	1	2	2	0	2	2	0	bank	0	0
	Apr	1	2	2	0	2	1	0	bank	0	0
Twin (Lower)	Feb	1	6	6	0	6	8	RBT:1	ice	1	0
	Apr	2	7	7	0	7	9	RBT:1	bank	1	0
	May	1	12	10	2	12	17	RBT:3, YP:21	boat:4, bank:8	24	0
	Aug	1	16	7	9	16	26	BC:1,YP:1, PS:10	boat:13, bank:3	12	0
Twin (Upper)	Jan	1	8	2	6	11	14	YP:250	ice	250	0
	Apr	1	0	0	0	0	0	0	0	0	0
	Jul	1	1	1	0	1	n/a	LMB:8, CRP:6	boat	6	LMB:8
	Aug	1	20	11	9	20	16	0	boat:18, bank:2	0	0

Appendix K. Length and number of fish collected from Cocolalla Lake, Idaho, on July 2, following the fish kill.

Date 7/2/96 Water Body Cocolalla Lake
purpose Fish kill investigation Collectors VP,

	yellow perch	channel catfish	brown bullhead	suckers	LM bass	black crappie	pumpkinseed
100							
110							
120	1						
130	2						
140							1
150	1						
160	4						
170	6			1			
180	11						
190	8						
200	3						
210	2						
220	1						
230							
240			1			2	
250							
260			2			1	
270			2				
280							
290		1		1			
300		1			1		
310		1					
320		1					
330		1					
340		3					
350		2					
360		6					
370		8					
380		5					
390		3					
400		4					
410		1					
420		1					
430							
440		1					
450		2					
460		1					
470		2					
480		2					
490							
500		1					
510							
520							
530							
540		1					
550							
560							
570							
580							
590							
600							
610							
620							
630		2					
640							
650							
660							
670							
680							
690							
700							
TOTAL	39	50	5	2	1	3	1

Notes *an additional 45 channel catfish not measured (on bottom, in brush, etc,)
*fungus and sores on about 10 yellow perch
*fish located around entire lake

Appendix L. Temperature and dissolved oxygen levels at seven sites in Cocolalla Lake, Idaho, July 3, collected as part of a fish kill investigation.

Depth (m)	Location													
	Site 1		Site 2		Site 3		Site 4		Site 5		Site 6		Site 7	
	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp	DO	Temp
Surface	9.3	20.9	9.6	21.1	8.2	21.2	9.6	21.1	10.2	21.8	9.6	22.6	9.1	23.4
1	8.6	20.6	9.1	20.4	9.2	20.2	9.2	20.0	9.7	20.0	9.4	20.9	9.0	20.7
2	8.2	19.7	9.1	19.3			9.3	19.2	9.7	19.3	9.1	20.0	8.8	20.2
3			9.1	18.4			9.2	18.6	9.5	18.8	9.1	19.5	9.0	19.6
4							8.6	18.0	9.4	18.1			9.0	18.2
5							8.5	17.5	9.1	17.5			9.2	17.5
6							8.7	17.1	8.7	17.0			8.6	16.8
7							7.8	16.6	7.4	16.1			5.1	15.4
8							7.5	16.3	6.0	15.5				
9							1.5	14.1	4.1	14.6				
10									1.0	13.6				
11									0.3	13.5				

Appendix M. Length, number, and species of fish collected in overnight sets of a floating and a sinking gillnet in Cocolalla Lake, Idaho, in July 8-9, 1996.

Date 7/9/96
purpose: collect fish for lab analysis

Water Body Cocolalla Lake
Collectors VP, JS gear: FGN

	yellow perch	channel catfish	brown bullhead	suckers	LM bass	black crappie	pumpkinseed
100							1
110							
120							
130	1						
140	8						
150	11						
160	14						
170	7						
180	4						
190	2						
200	1						
210	2						
220							
230							
240							
250			1				
260			1			1	
270				1			
280							
290							
300							
310							
320							
330							
340		1					
350							
360		2					
370							
380		2					
390		1					
400		1					
410		1					
420							
430		1					
440		1					
450		1					
460							
470		2					
480		2					
490		1					
500							
510							
520							
530							
540		2					
550							
560							
570							
580							
590							
600							
610							
620							
630							
640							
650							
660							
670							
680							
690							
700							
TOTAL	50	18	2	1	0	1	1

Notes floating gillnet, set on S. end of lake at 2030 h.
overnight set

Appendix M (Cont'd).

Date	7/9/96	Water Body	Cocolalla Lake		
purpose:	collect fish for lab analysis	Collectors	VP, JS	gear:	SGN

	yellow perch	channel catfish	brown bullhead	suckers	LM bass	black crappie	pumpkinseed
100							
110							
120							
130	1						
140	4					1	
150	10						1
160	9						
170	4					1	
180	9						
190	5						
200	2						
210	2						
220	1						
230				1			
240							
250							
260							
270						1	
280							
290							
300							
310							
320				1			
330							
340							
350							
360							
370		1					
380		1					
390		4		1			
400		1					
410							
420		2					
430		3					
440							
450							
460		1					
470							
480							
490		1		1			
500				1			
510		1		1			
520		1					
530		1					
540							
550							
560		1					
570							
580							
590							
600							
610							
620							
630							
640							
650							
660							
670							
680							
690							
700							
TOTAL	47	18	0	6	0	3	1

Notes sinking gillnet, set on S. end of lake at 2030 h.
overnight set

Appendix N. Standard Lake survey data collected from Bonner Lake, Idaho, in 1996.

LAKE/RESERVOIR NAME: BONNER LAKE REGION: 1

DATE: 7/18/96 SAMPLE CREW: PERO MEDROW

SCALE ENVELOPE NUMBERS: 1 TO 60

SAMPLING CONDITIONS:

Water Temp. (°C @ .5 m): 23.2 Air Temp. Range (°C): 14 to 20

Secchi Range (m): 2.5 to 3.0

Wind (may circle more than one): 0-10 10-20 20+ mph

N NE E SE S SW W NW

SAMPLING EFFORT:

Combined floating and sinking gill net: 2 nights

Electrofishing: 1 hours; trap net: 2 nights

Other (including add'l size selective sampling): ______

SAMPLING LOCATIONS:

Draw or attach a lake/reservoir map and indicate fisheries and limnological sampling locations; footnoting with narrative if necessary.

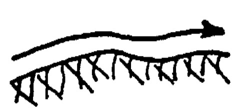
KEY:


Trap Net

S-X Secchi reading


Gill Net (F,S,FS)

TDO-X Surface/bottom and profile readings


Electrofishing

Appendix N. Continued.

LIMNOLOGICAL CHARACTERISTICS
(To be measured during July 20-Sept. 10 period.
Measurement locations to be indicated on file map.)

LAKE/RESERVOIR NAME: BONNER LAKE REGION: 1

DATE: 7/18/96 PERSON COMPLETING FORM: MEDROW

NOTE: SITE 1 OF 2 @ 55ft.

MINIMUM DATA SET:

pH: ______ surface ______ bottom Total alkalinity (ppm): ______ surface ______ bottom

Conductivity (µmhos): 51 surface

Secchi (m): 2.5 m location 1, 3.0 m location 2, 3.0 m location 3, 2.5 m location 4 = 2.75 M mean

Temperature and D.O. profile:
(measured at 1-m increments or 10 depth intervals)

Temperature (°C):	23.2	23.2 (cont'd)	22.7	17.2 / 5.5	11.1 / 5.4	8.7 / 5.3	7.2 / 5.1	6.6 / 5.1	6.1 / 5.1	5.9 / 5.1
D.O. (ppm):	6.5	6.5 (cont'd)	6.2	7.1 / 0.5	2.6 / 0.5	1.2 / 0.5	0.7 / 0.5	0.6 / 0.5	0.5 / 0.5	0.5 / 0.5
Depth (m):	Surface	1	2	3 / 10	4 / 11	5 / 12	6 / 13	7 / 14	8 / 15	9 / 16

Volume of trout habitat (<21°C, >5 ppm D.O.): 127,398.16 m³ 2.5-3.5 M 8 ft - 11.5

Trout habitat as a percent of full pool volume: 19.4 %

OPTIONAL ADDITIONAL DATA:

Chlorophyll a (µ g/L): ______ Total phosphates (mg/L): ______

T.D.S. (mg/L): ______ Nitrate nitrogen (mg/L): ______

Zooplankton (no/L >____): ______

Appendix N (Cont'd).

LIMNOLOGICAL CHARACTERISTICS
(To be measured during July 20-Sept. 10 period.
Measurement locations to be indicated on file map.)

LAKE/RESERVOIR NAME: Bonney Lake **REGION:** 1

DATE: 7/18/96 **PERSON COMPLETING FORM:** Pero, Medrow

Note: Site 2 of 2 @ 44ft

MINIMUM DATA SET:

pH: ______ surface ______ bottom   Total alkalinity (ppm): ______ surface ______ bottom

Conductivity (µmhos): 50 surface

Secchi (m): ______ location 1, ______ location 2, ______ location 3, ______ location 4 = ______ mean

Temperature and D.O. profile:
(measured at 1-m increments or 10 depth intervals)

Temperature (°C):	23.1	23.1	22.4	16.7	11.0	7.9	6.8	6.2 / 5.9	6.1 / 5.9	6.0 / 5.9
D.O. (ppm):	7.1	6.5	6.6	6.9	2.3	1.0	0.7	0.6 / 0.5	0.5 / 0.4	0.5 / 0.4
Depth (m):	Surface	1	2	3	4	5	6	7 / 10	8 / 11	9 / 12

Volume of trout habitat (<21°C, >5 ppm D.O.): 91,316 m³   2.5m – 3.5

Trout habitat as a percent of full pool volume: 13.9 %

OPTIONAL ADDITIONAL DATA:

Chlorophyll a (µ g/L): ______ Total phosphates (mg/L): ______

T.D.S. (mg/L): ______ Nitrate nitrogen (mg/L): ______

Zooplankton (no/L >____): ______

CATCH COMPOSITION OF: (species) Rainbow Trout LAKE/RESERVOIR: Bonner Lake

DATE: June 4 (E-fish) June 24 (nets) PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
50-59							
60-69							
70-79							
80-89							
90-99							
100-109							
110-119							
120-129							
130-139							
140-149							
150-159							
160-169							
170-179							
180-189							
190-199							
200-209							
210-219	2	4.3	110	102			
220-229	1	2.2	110	95			
230-239	7	15.2	143.3	108			
240-249	10	21.7	157.5	104			
250-259	10	21.7	182.5	106			
260-269	9	19.6	206.97	107			
270-279	2	4.3	220	100			
280-289	1	2.2	260	102			
290-299	1	2.2	300	110			
300-309							
310-319							
320-329	1	2.2	320	87			
330-339							

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
340-349	1	2.2	470	100.8			
350-359							
360-369	1	2.2	455	82			
370-379							
380-389							
390-399							
400-409							
410-419							
420-429							
430-439							
440-449							
450-459							
460-469							
470-479							
480-489							
490-499							
500-509							
510-519							
520-529							
530-539							
540-549							
550-559							
560-569							
570-579							
580-589							
590-599							
600-609							
610-619							
620-629							
TOTAL	46	100	8830				

$\bar{X}$ Wr = 100.7

TOTAL CATCH PER EFFORT OF: GILL NET 43 ELECTROFISHING 3 TRAP NET 0

CATCH COMPOSITION OF: (species) BROOK TROUT LAKE/RESERVOIR: BONNER LAKE

DATE: June 4, 24 1996 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M
								340-349							
50-59								350-359	1	100	410	90			
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	1	100					

TOTAL CATCH PER EFFORT OF: GILL NET 1 ELECTROFISHING 0 TRAP NET 0

Appendix N (Cont'd).

CATCH COMPOSITION OF: (species) LARGE MOUTH BASS LAKE/RESERVOIR: BONNER LAKE

DATE: June 4, 24 1996 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
~~50-59~~								350-359							
~~60-69~~								360-369							
~~70-79~~								370-379							
~~80-89~~								380-389							
>100 ~~90-99~~	133	48.2	70.0					390-399							
100-109	16	5.8	13					400-409	1	0.36	750	77			
110-119	24	8.7	14.7					410-419	2	0.72	950	90			
120-129	16	5.8	23					420-429	1	0.36	1200	105			
130-139	11	4.0	25					430-439							
140-149	9	3.3	38					440-449	1	0.36	1350	94			
150-159	6	2.2	58	97				450-459							
160-169	12	4.3	51.3	105				460-469							
170-179	12	4.3	67.5	114				470-479							
180-189	11	4.0	67	94				480-489							
190-199	6	2.2	77	90				490-499							
200-209	1	0.36	90	90				500-509							
210-219	6	2.2	110	93				510-519							
220-229	1	0.36	150	108				520-529							
230-239	1	0.36	180	113				530-539							
240-249	1	0.36	209	114				540-549							
250-259								550-559							
260-269	1	0.36	240	101				560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319	2	0.72	440	104				610-619							
320-329	2	0.72	435	93				620-629							
330-339								TOTAL	276	100	14017.4	99			

$PSD = \frac{9}{20} \times 100 = 45$

$\bar{X}\ Wr = 98.9$

TOTAL CATCH PER EFFORT OF: GILL NET 3 ELECTROFISHING 273 TRAP NET 0

Appendix A (Cont'd).

CATCH COMPOSITION OF: (species) Pumpkinseed LAKE/RESERVOIR: Bonner Lake

DATE: June 4, 24 1996 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
~~50-59~~								350-359							
~~60-69~~								360-369							
~~70-79~~								370-379							
~~80-89~~								380-389							
<100 ~~90-99~~	28	26.4	16.3					390-399							
100-109	21	19.8	19.8					400-409							
110-119	26	24.5	27.2					410-419							
120-129	16	15.1	31.5					420-429							
130-139	6	5.7	36					430-439							
140-149	4	3.8	55					440-449							
150-159	4	3.8	78					450-459							
160-169	1	0.94	92					460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	106	100	29234				

PSD = $\frac{5}{106} \times 100 = 4.72$

TOTAL CATCH PER EFFORT OF: GILL NET 10 ELECTROFISHING 93 TRAP NET 3

FISH COMMUNITY CHARACTERISTICS

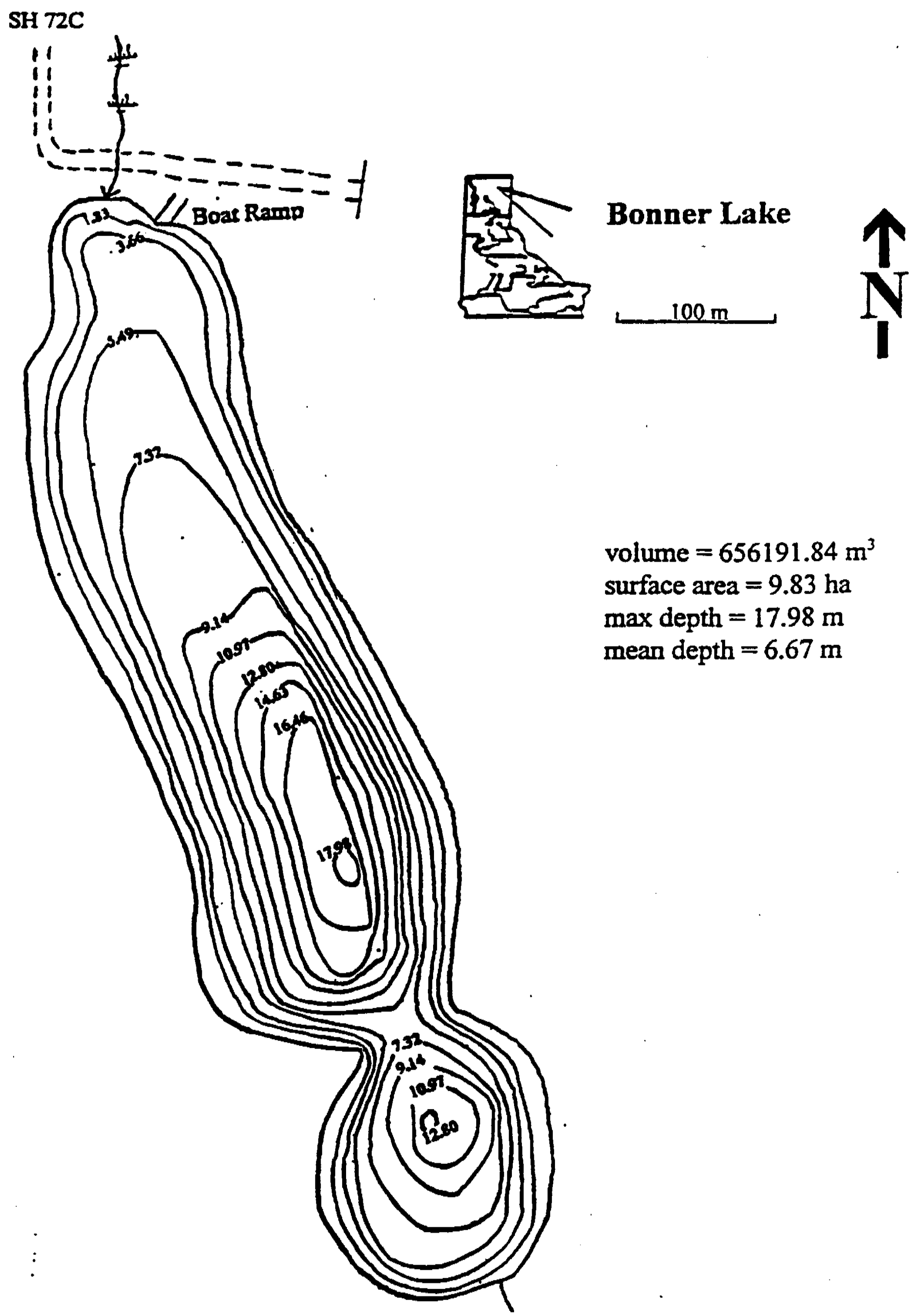
LAKE/RESERVOIR NAME: BONNER LAKE REGION: 1 DATE: 6/24/96

Catch Per Unit* of Combined Gear Sampling Effort 5/3 = 1.67

SPECIES	LENGTH - RANGE (mm)	No.	%	Wt. (kg)	%
RBT	210 - 369	46	10.7	8.8221	33.7
BKT	350 - 359	1	0.23	0.41	1.6
LMB	>100 - 449	276	64.3	14.0174	53.5
PS	>100 - 169	106	24.7	2.92	11.2
	-				
	-				
	-				
	-				
	-				
	-				
	-				
GAME FISH SUBTOTAL:		429	100	26.17	100
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
NON-GAME FISH SUBTOTAL:		—		—	
ALL SPECIES TOTAL:		429	100%	26.1729	100%

* one hour electrofishing, one trap net night, and one combined floating and sinking gill net night.

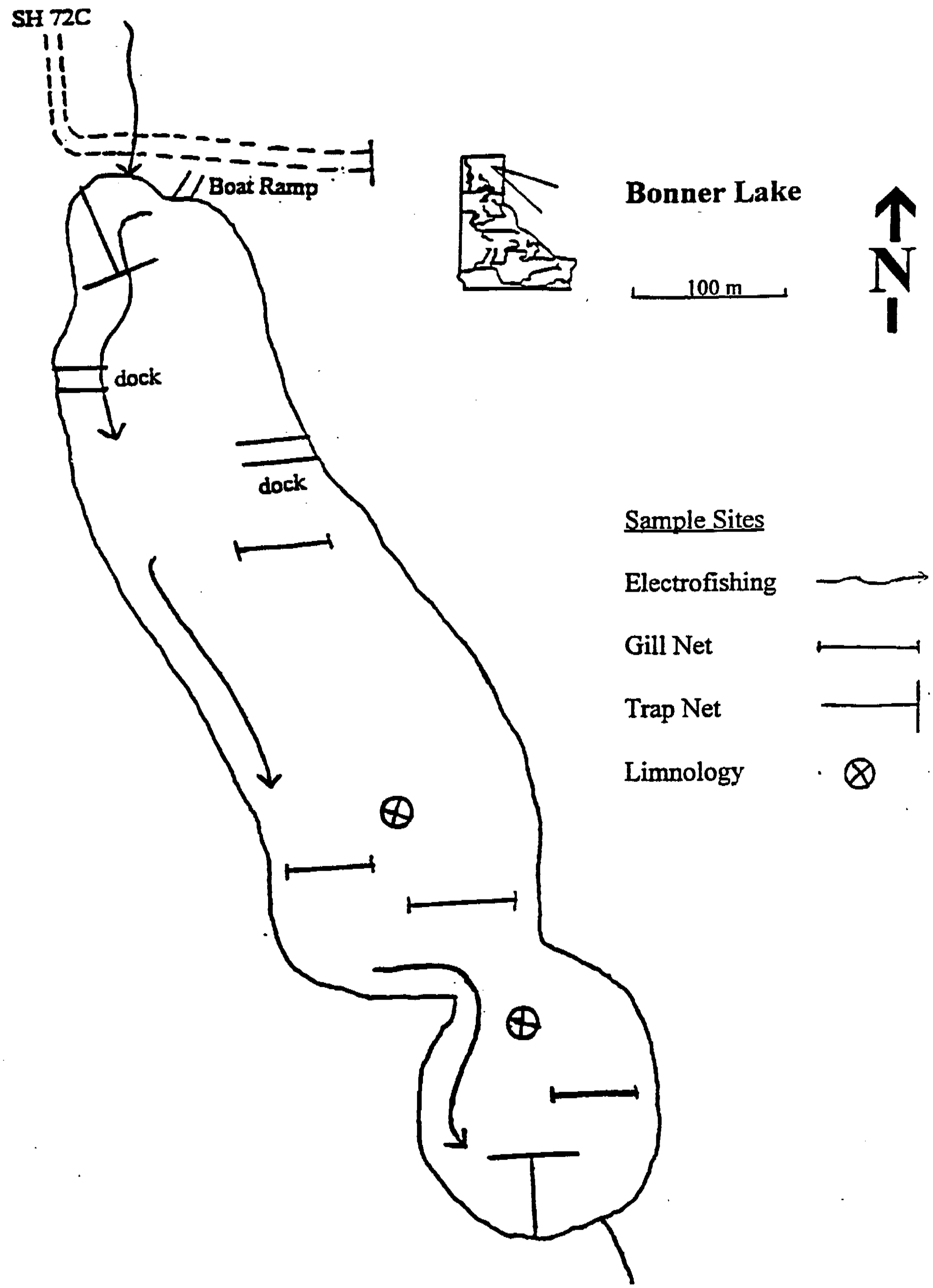
Appendix N (Cont'd).



volume = 656191.84 m^3
surface area = 9.83 ha
max depth = 17.98 m
mean depth = 6.67 m

Bathymetric map of Bonner Lake, Idaho, showing depth contours in meters with total lake volume, lake surface area, and maximum and mean depth.

Appendix N (Cont'd).



Map of Bonner Lake, Idaho, showing electrofishing, gill netting, trap netting, and limnological sample sites.

Appendix O. Standard Lake survey data collected from Bloom Lake, Idaho, in 1996.

COVER SHEET

LAKE/RESERVOIR NAME: BLOOM LAKE REGION: 1

DATE: 7/29/96 SAMPLE CREW: MEDROW PERO

SCALE ENVELOPE NUMBERS: ____________ TO ____________

SAMPLING CONDITIONS:

Water Temp. (°C @ .5 m): 21.6 Air Temp. Range (°C): 18 to 32

Secchi Range (m): 2.0 to 2.5

Wind (may circle more than one): 0-10 10-20 20+ mph

N NE E SE S SW W NW

SAMPLING EFFORT:

Combined floating and sinking gill net: 2 nights

Electrofishing: 0.5 hours; trap net: 2 nights

Other (including add'l size selective sampling): ____________

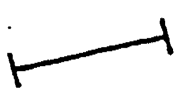
SAMPLING LOCATIONS:

Draw or attach a lake/reservoir map and indicate fisheries and limnological sampling locations; footnoting with narrative if necessary.

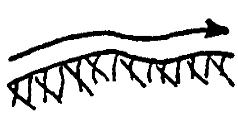
KEY:


Trap Net

S-X Secchi reading


Gill Net (F,S,FS)

TDO-X Surface/bottom and profile readings


Electrofishing

LIMNOLOGICAL CHARACTERISTICS
(To be measured during July 20-Sept. 10 period.
Measurement locations to be indicated on file map.)

LAKE/RESERVOIR NAME: BLOOM LAKE REGION: 1

DATE: 7/29/96 PERSON COMPLETING FORM: MEDROW

NOTE: SITE 1 or 2 @ 19ft.

MINIMUM DATA SET:

pH: ____ surface ____ bottom Total alkalinity (ppm): ____ surface ____ bottom

Conductivity (µmhos): 70 surface

Secchi (m): 2.0 location 1, 2.5 location 2, 2.0 location 3, 2.0 location 4 = 2.13 mean

Temperature and D.O. profile:
(measured at 1-m increments or 10 depth intervals)

Temperature (°C):	21.6	21.6	21.6	21.4	19.5	16.6	15.4			
D.O. (ppm):	7.3	7.0	7.1	7.2	8.9	6.6	1.5			
Depth (m):	SURFACE	1	2	3	4	5	6			

Volume of trout habitat (<21°C, >5 ppm D.O.): 11,402.16 m^3

Trout habitat as a percent of full pool volume: ____ %

OPTIONAL ADDITIONAL DATA:

Chlorophyll a (µ g/L): ____ Total phosphates (mg/L): ____

T.D.S. (mg/L): ____ Nitrate nitrogen (mg/L): ____

Zooplankton (no/L >____): ____

FISH COMMUNITY CHARACTERISTICS

LAKE/RESERVOIR NAME: Bloom Lake REGION: 1 DATE: 7/23/96

Catch Per Unit* of Combined Gear Sampling Effort

SPECIES	LENGTH - RANGE(mm)	No.	%	Wt.(kg)	%
BKT	120 - 289	109	29.9	10.67633	64.8
PS	<80 - 169	256	70.1	5.798	35.2
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
GAME FISH SUBTOTAL:		365	100	16.47	100
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
	-				
NON-GAME FISH SUBTOTAL:					
ALL SPECIES TOTAL:		365	100%	16.47513	100%

* one hour electrofishing, one trap net night, and one combined floating and sinking gill net night.

Appendix O. Continued.

CATCH COMPOSITION OF: (species) BROOK TROUT LAKE/RESERVOIR: BLOOM LAKE

DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129	1	0.92	12					420-429							
130-139	2	1.8	23.5	106				430-439							
140-149	5	4.6	28.75	103				440-449							
150-159	7	6.4	33.29	97				450-459							
160-169	5	4.6	42.8	102				460-469							
170-179								470-479							
180-189								480-489							
190-199	3	2.7	87.3	124				490-499							
200-209	3	2.7	95.3	103				500-509							
210-219	6	5.5	95.8	90				510-519							
220-229	12	11.0	99.25	90				520-529							
230-239	35	32.1	111.07	88				530-539							
240-249	19	17.4	121.5	84				540-549							
250-259	7	6.4	137	84				550-559							
260-269	2	1.8	150	82				560-569							
270-279	1	0.92	165	80				570-579							
280-289	1	0.92	180	78				580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	109	100	10676.33				

$PSD = \frac{\text{quality } (330)}{\text{stock } (200)} = \frac{0}{88}$

TOTAL CATCH PER EFFORT OF: GILL NET 93 ELECTROFISHING 15 TRAP NET 1

Appendix O. Continued.

CATCH COMPOSITION OF: (species) PUMPKINSEED LAKE/RESERVOIR: BLOOM LAKE

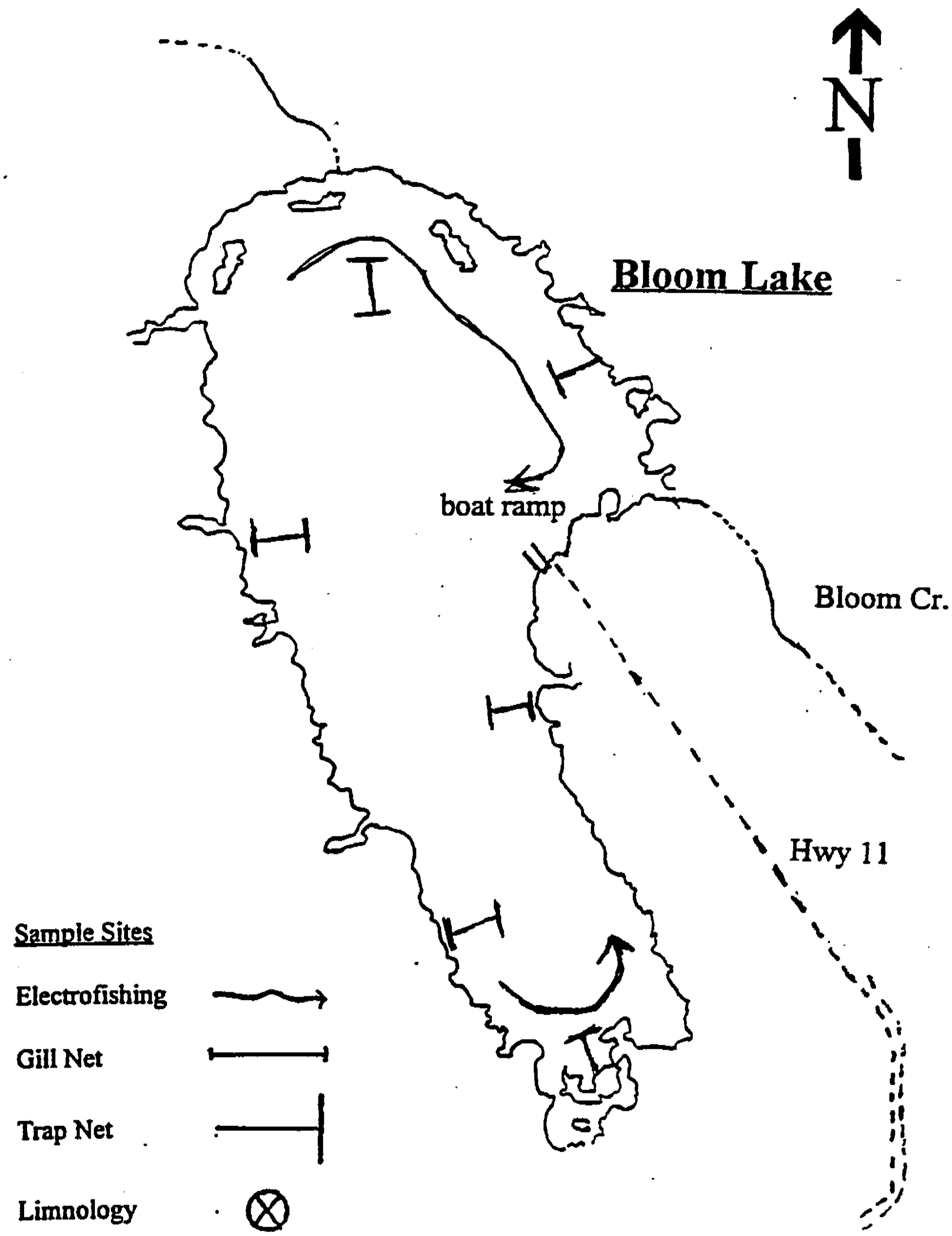
DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
BATCH	124	48.4						340-349							
50-59								350-359							
60-69								360-369							
~~70-79~~ <80	5	1.9	8					370-379							
80-89	9	3.5	13					380-389							
90-99	15	5.8	18.5					390-399							
100-109	5	1.9	22.5					400-409							
110-119	3	1.2	42					410-419							
120-129	12	4.7	43.2					420-429							
130-139	47	18.4	45.7					430-439							
140-149	26	10.2	63					440-449							
150-159	9	3.5	82.5					450-459							
160-169	1	0.40	79					460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	256	100	5798.8				

PSD = 150 mm / 80 mm ⇒ 10/127 ⇒ 7.9

TOTAL CATCH PER EFFORT OF: GILL NET 48 ELECTROFISHING 185 TRAP NET 23

Appendix O. Continued.



Map of Bloom Lake showing 1996 gill net, trap net, and electrofishing locations.

Appendix P. Standard Lake survey data collected from Anderson Lake, Idaho, in 1996.

COVER SHEET

LAKE/RESERVOIR NAME: ANDERSON LAKE **REGION:** 1

DATE: 7/11/96 **SAMPLE CREW:** MEDROW, PEEO

SCALE ENVELOPE NUMBERS: ________ **TO** ________

SAMPLING CONDITIONS:

Water Temp. (°C @ .5 m): 23.5 Air Temp. Range (°C): 20 to 25

Secchi Range (m): 1.75 to 2.0

Wind (may circle more than one): 0-10 10-20 20+ mph

N NE E SE S SW W NW

SAMPLING EFFORT:

Combined floating and sinking gill net: 2 nights

Electrofishing: 1 hours; trap net: 2 nights

Other (including add'l size selective sampling): ________

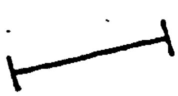
SAMPLING LOCATIONS:

Draw or attach a lake/reservoir map and indicate fisheries and limnological sampling locations; footnoting with narrative if necessary.

KEY:


Trap Net

S-X Secchi reading


Gill Net (F,S,FS)

TDO-X Surface/bottom and profile readings


Electrofishing

LIMNOLOGICAL CHARACTERISTICS
(To be measured during July 20-Sept. 10 period.
Measurement locations to be indicated on file map.)

LAKE/RESERVOIR NAME: ANDERSON LAKE REGION: 1

DATE: 7/11/96 PERSON COMPLETING FORM: MEDROW, PERO

MINIMUM DATA SET:

pH: 6.4 (surface) ____ (bottom) Total alkalinity (ppm): ____ (surface) ____ (bottom)

Conductivity (µmhos): 68 (surface)

Secchi (m): 2.0 (location 1), 2.0 (location 2), 1.75 (location 3), 2.0 (location 4) = ____ (mean)

Temperature and D.O. profile:
(measured at 1-m increments or 10 depth intervals)

Temperature (°C):	23.5	22.8	22.5	21.0	19.8	18.1				
D.O. (ppm):	7.6	7.1	7.3	7.1	5.7	1.0				
Depth (m):	SURFACE	1	2	3	4	5				

Volume of trout habitat (<21°C, >5 ppm D.O.): ____ m^3

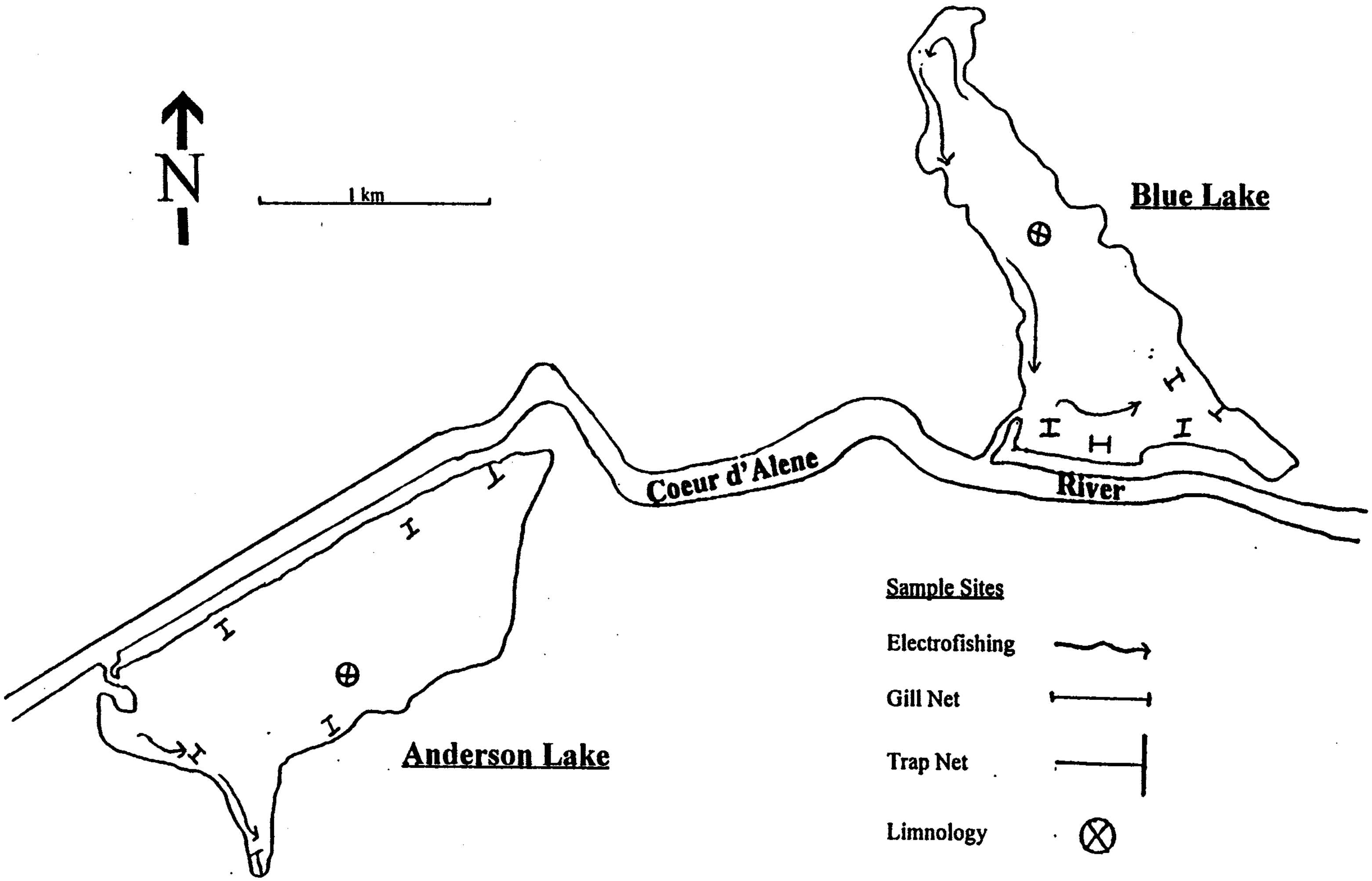
Trout habitat as a percent of full pool volume: ____ %

OPTIONAL ADDITIONAL DATA:

Chlorophyll a (µ g/L): ____ Total phosphates (mg/L): ____

T.D.S. (mg/L): ____ Nitrate nitrogen (mg/L): ____

Zooplankton (no/L >____): ____



Map of Anderson and Blue lakes, Idaho, showing 1996 electrofishing, gill netting, trap netting, and limnological sample sites.

Appendix P. Continued.

FISH COMMUNITY CHARACTERISTICS

LAKE/RESERVOIR NAME: ANDERSON LAKE REGION: 1 DATE: 7/11/96

Catch Per Unit* of Combined Gear Sampling Effort

SPECIES	LENGTH - RANGE(mm)	No.	%	Wt.(kg)	%
B.C.	140 - 239	9	2.8	0.679	
N.P.	430 - 689	10	3.1	9.49	
Y.P.	140 - 219	124	38.2	0.717	
LMB	130 - 519	39	12.0	18.513	
PS	90 - 109	56	17.2	1.137 — estimate	
BBH	180 - 289	56	17.2	6.363	
	-				
	-				
	-				
	-				
	-				
GAME FISH SUBTOTAL:		294	90.5	36.9	60
	-				
SUCKER	320 - 579	11	3.4	12.58 — estimate	
	-				
SQUAFISH	260 - 320	5	1.5	0.99	
TENCH	360 - 419	15	4.6	10.575 — estimate	
	-				
	-				
	-				
	-				
	-				
	-				
	-				
NON-GAME FISH SUBTOTAL:		31	9.5	24.15	40
ALL SPECIES TOTAL:		325	100%	61.0	100%

*one hour electrofishing, one trap net night, and one combined floating and sinking gill net night.

Appendix P. Continued.

CATCH COMPOSITION OF: (species) Northern Pike LAKE/RESERVOIR: Anderson Lake

DATE: 6/6/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
650-659								350-359							
660-669	1	10	1800.0	99.8				360-369							
670-679								370-379							
680-689	1	10	1750.0	89				380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439	1	10	510.0	105			
140-149								440-449	1	10	550.0	105			
150-159								450-459							
160-169								460-469							
170-179								470-479	2	20	630.0	99			
180-189								480-489	2	20	710.0	104			
190-199								490-499							
200-209								500-509	1	10	850.0	110			
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559			$\bar{X}$	Wr =	100.4		
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629	1	10	1350.0	91			
330-339								TOTAL	10	100	9480				

TOTAL CATCH PER EFFORT OF: GILL NET 7 ELECTROFISHING 3 TRAP NET 0

Appendix P. Continued.

CATCH COMPOSITION OF: (species) BLACK CRAPPIE LAKE/RESERVOIR: ANDERSON LAKE

DATE: 6/6/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149	2	22.2	39.0	107				440-449							
150-159	1	11.1	50.0	109				450-459							
160-169	2	22.2	62.5	110				460-469							
170-179	2	22.2	75.5	108				470-479							
180-189								480-489							
190-199								490-499							
200-209	1	11.1	85.0	70				500-509							
210-219								510-519							
220-229								520-529							
230-239	1	11.1	190.0	99				530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	9	100.	679				

$\bar{X}$ Wr = 100.5

TOTAL CATCH PER EFFORT OF: GILL NET 3 ELECTROFISHING 6 TRAP NET 0

Appendix P. Continued.

CATCH COMPOSITION OF: (species) YELLOW PERCH LAKE/RESERVOIR: ANDERSON LAKE

DATE: 7/11/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
BATCH	112	90.3						340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149	1	0.81	33.0	94				440-449							
150-159	7	5.6	35.0	80				450-459							
160-169	2	1.61	40.0	74				460-469							
170-179	4	3.23	49.2	82				470-479							
180-189								480-489							
190-199	1	0.81	75.0	80				490-499							
200-209								500-509							
210-219	1	0.81	87.0	67				510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259			$\bar{X}$ Wr =		80			550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	124	100	716.9				

TOTAL CATCH PER EFFORT OF: GILL NET 16 ELECTROFISHING 112 TRAP NET 0

Appendix P. Continued.

CATCH COMPOSITION OF: (species) Pumpkin seed LAKE/RESERVOIR: Anderson Lake

DATE: 8/7/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
Batch	52	92.8						340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99	2	36	17.0	1.4				390-399							
100-109	2	3.6	24.0	1.3				400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	56	-	1139?				

TOTAL CATCH PER EFFORT OF: GILL NET 4 ELECTROFISHING 52 TRAP NET 0

Appendix P. Continued.

CATCH COMPOSITION OF: (species) LMB LAKE/RESERVOIR: ANDERSON LAKE

DATE: ED 6/6/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Total wt.	Wr ~~Age(s)~~	Maturity ♂ I/M	Maturity ♀ I/M
50-59							
60-69							
70-79							
80-89							
90-99							
100-109							
110-119							
120-129							
130-139	3	7.7	34	102			
140-149							
150-159							
160-169	2	5.1	61.5	123	126		
170-179	2	5.1	66	132	111		
180-189	4	10.3	80	320	112		
190-199	1	2.6	88	88	103		
200-209	4	10.3	103.25	413	102		
210-219	2	5.1	112.5	225	96		
220-229	2	5.1	155.0	310	112		
230-239							
240-249	2	5.1	202.5	405	111		
250-259							
260-269							
270-279	1	2.6	250.0		93		
280-289	1	2.6	300.0		99		
290-299							
300-309							
310-319							
320-329							
330-339	1	2.6					

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
340-349	1	2.6	375				
350-359	1	2.6	560.0	89			
360-369	1	2.6	700.0	102			
370-379							
380-389							
390-399							
400-409	1	2.6	500.0	82			
410-419	1	2.6	850.0	81			
420-429							
430-439	2	5.1	990.0	1980	80		
440-449	2	5.1	1025.0	2050	77		
450-459							
460-469							
470-479	1	2.6	1200.0	73			
480-489	1	2.6	1150.0	65			
490-499	1	2.6	1500.0	79			
500-509	1	2.6	1750.0	87			
510-519	1	2.6	2000.0	93			
520-529							
530-539							
540-549							
550-559							
560-569							
570-579							
580-589							
590-599							
600-609							
610-619							
620-629							
TOTAL	39	100	18513				

TOTAL CATCH PER EFFORT OF: GILL NET 6 ELECTROFISHING 33 TRAP NET 0

Appendix P. Continued.

CATCH COMPOSITION OF:(species) Brown Bull Head LAKE/RESERVOIR: Anderson Lake

DATE: 6/6/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M
BATCH	20	35.7						340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189	1	1.8	95.0					480-489							
190-199								490-499							
200-209								500-509							
210-219	5	8.9	129.0					510-519							
220-229	8	14.3	155.0					520-529							
230-239	11	19.6	168.0					530-539							
240-249	5	8.9	203.0					540-549							
250-259	4	7.1	207.5					550-559							
260-269								560-569							
270-279								570-579							
280-289	2	3.6	345.0					580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	56	100	6363				

TOTAL CATCH PER EFFORT OF: GILL NET 32 ELECTROFISHING 20 TRAP NET 4

Appendix P. Continued.

CATCH COMPOSITION OF:(species) Sucker LAKE/RESERVOIR: Anderson Lake

DATE: 8/7/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349	2	18.2	350				
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409	1	9.1	780				
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499	1	9.1	1452				
200-209								500-509	2	18.2	1545				
210-219								510-519							
220-229								520-529	1	9.1	1742				
230-239								530-539							
240-249								540-549							
250-259								550-559	1	9.1	2068				
260-269								560-569							
270-279								570-579	1	9.1	2306				
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329	2	18.2	394					620-629							
330-339								TOTAL	11	100	≈ 12,576				

– Wts. were not taken on Suckers so I used a Wr equation for White Suckers to estimate weights of these fish for use with the biomass breakdown.

TOTAL CATCH PER EFFORT OF: GILL NET 1 ELECTROFISHING 10 TRAP NET 0

Appendix P. Continued.

CATCH COMPOSITION OF: (species) SQUAWFISH LAKE/RESERVOIR: ANDERSON LAK

DATE: 8/7/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269	1	20	160.0					560-569							
270-279								570-579							
280-289	1	20	190.0					580-589							
290-299	1	20	200.0					590-599							
300-309	1	20	210.0					600-609							
310-319								610-619							
320-329	1	20	230					620-629							
330-339								TOTAL	5	100	990				

TOTAL CATCH PER EFFORT OF: GILL NET 5 ELECTROFISHING 0 TRAP NET 0

Appendix P. Continued.

CATCH COMPOSITION OF: (species) TENCH LAKE/RESERVOIR: ANDERSON LAKE

DATE: 7-11-96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
BATCH	10	66.6						340-349							
50-59								350-359							
60-69								360-369	1	6.7	550.0				
70-79								370-379	1	6.7	600.0				
80-89								380-389	1	6.7	690.0				
90-99								390-399	1	6.7	750.0				
100-109								400-409							
110-119								410-419	1	6.7	900.0				
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	15	100					

TOTAL CATCH PER EFFORT OF: GILL NET 4 ELECTROFISHING 10 TRAP NET 1

Appendix Q. Standard Lake survey data collected from Blue Lake, Idaho, in 1996.

COVER SHEET

LAKE/RESERVOIR NAME: BLUE LAKE (KOOTENAI CO) REGION: 1

DATE: 7/29/[illegible] SAMPLE CREW: MEDROW, PIRO

SCALE ENVELOPE NUMBERS: ______ TO ______

SAMPLING CONDITIONS:

Water Temp. (°C @ .5 m): 22.1 Air Temp. Range (°C): 25 to 28

Secchi Range (m): 2 to 3.5

Wind (may circle more than one): 0-10 10-20 20+ mph

N NE E SE S SW W NW

SAMPLING EFFORT:

Combined floating and sinking gill net: 2 nights

Electrofishing: 1.25 hours; trap net: 1 nights

Other (including add'l size selective sampling): ______

SAMPLING LOCATIONS:

Draw or attach a lake/reservoir map and indicate fisheries and limnological sampling locations; footnoting with narrative if necessary.

KEY:

Trap Net — S-X Secchi reading

Gill Net (F,S,FS) — TDO-X Surface/bottom and profile readings

Electrofishing

Appendix Q. Continued.

LIMNOLOGICAL CHARACTERISTICS
(To be measured during July 20-Sept. 10 period.
Measurement locations to be indicated on file map.)

LAKE/RESERVOIR NAME: BLUE LAKE (KOOTENAI CO) REGION: 1

DATE: 7/11/16 PERSON COMPLETING FORM: MEDROW, PERO

MINIMUM DATA SET:

pH: 7.43 (surface) ____ (bottom) Total alkalinity (ppm): ____ (surface) ____ (bottom)

Conductivity (µmhos): 60 (surface)

Secchi (m): 3.5 (location 1), 3.25 (location 2), 2 (location 3), 3.5 (location 4) = 3.06 (mean)

Temperature and D.O. profile:
(measured at 1-m increments or 10 depth intervals)

Temperature (°C):	22.1	21.6	21.4	20.9	19.6	18.2	16.4			
D.O. (ppm):	7.5	7.6	7.6	7.3	7.6	6.9	1.5			
Depth (m):	SURFACE	1	2	3	4	5	6			

Volume of trout habitat (<21°C, >5 ppm D.O.): ____ m^3

Trout habitat as a percent of full pool volume: ____ %

OPTIONAL ADDITIONAL DATA:

Chlorophyll a (µ g/L): ____ Total phosphates (mg/L): ____

T.D.S. (mg/L): ____ Nitrate nitrogen (mg/L): ____

Zooplankton (no/L >____): ____

Appendix Q. Continued.

CATCH COMPOSITION OF: (species) LMB LAKE/RESERVOIR: BLUE LAKE KOOTENAI Co

DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369	1	5.6	725	105			
70-79	1	5.6	6					370-379	1	5.6	720	95			
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419	1	5.6	910	86			
120-129	1	5.6	47					420-429	1	5.6	1200	105			
130-139	2	11.1	36.5					430-439	1	5.6	850	69			
140-149	2	11.1	52					440-449	1	5.6	1100	83			
150-159								450-459							
160-169								460-469							
170-179								470-479	1	5.6	1550	94			
180-189								480-489							
190-199	1	5.6	70	82				490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559	1	5.6	2300	83			
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299	1	5.6	340	100				590-599							
300-309	1	5.6	370	97				600-609							
310-319								610-619							
320-329								620-629							
330-339	1	5.6	450	87				TOTAL	18	100	10815				

PSD = 91

RSD-P = 5

TOTAL CATCH PER EFFORT OF: GILL NET 5 ELECTROFISHING 13 TRAP NET 0

Appendix Q. Continued.

CATCH COMPOSITION OF: (species) Yellow Perch LAKE/RESERVOIR: Blue Lake (Kootenai Co

DATE: 7/25/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
BATCH	211	89.8						340-349							
50-59								350-359							
60-69								360-369							
70-79	2	0.85						370-379							
80-89	5	2.1						380-389							
90-99	3	1.3						390-399							
100-109								400-409							
110-119	2	0.85						410-419							
120-129	5	2.1						420-429							
130-139	2	0.95						430-439							
140-149	2	0.85						440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199	1	0.42	75					490-499							
200-209	1	0.42	100					500-509							
210-219								510-519							
220-229	1	0.42						520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	235	100					

TOTAL CATCH PER EFFORT OF: GILL NET 2 ELECTROFISHING 233 TRAP NET 0

Appendix Q. Continued.

CATCH COMPOSITION OF: (species) PUMPKINSEED LAKE/RESERVOIR: BLUE LAKE (KOOTENAI C

DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M
								340-349							
50-59	1	9.1						350-359							
60-69	1	9.1						360-369							
70-79	4	36.4						370-379							
80-89	1	9.1						380-389							
90-99	1	9.1						390-399							
100-109	1	9.1	19					400-409							
110-119								410-419							
120-129	2	18.2	35					420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539	PSD = 0						
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	11	100	133				

TOTAL CATCH PER EFFORT OF: GILL NET 2 ELECTROFISHING 8 TRAP NET 1

estimate based on St. wt

Appendix Q. Continued.

CATCH COMPOSITION OF: (species) TENCH LAKE/RESERVOIR: BLUE LAKE (KOOTENAI

DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M
BATCH	14	35.9						340-349	2	5.1	530				
50-59								350-359	5	12.8	590				
60-69								360-369	4	10.3					
70-79								370-379	1	2.6					
80-89								380-389	6	15.4	730				
90-99								390-399	1	2.6					
100-109								400-409	1	2.6					
110-119								410-419							
120-129	1	2.6						420-429	1	2.6					
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489	2	5.1					
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339	1	2.6	520					TOTAL	39	-	24050				

TOTAL CATCH PER EFFORT OF: GILL NET 8 ELECTROFISHING 31 TRAP NET 0

[illegible] 616.

Appendix Q. Continued.

CATCH COMPOSITION OF:(species) Northern Pike LAKE/RESERVOIR: Blue Lake (Kootenai Co

DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
630-639	1	8.3	1500	96				340-349							
650-659	1	8.3	1500	87				350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399	1	8.3	370	103			
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469	1	8.3	600	100			
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549	1	8.3	980	100			
250-259								550-559	1	8.3	970	89			
260-269								560-569							
270-279								570-579	3	25	1200	104			
280-289								580-589	1	8.3	1250	103			
290-299								590-599							
300-309								600-609	1	8.3	1140	85			
310-319								610-619							
320-329								620-629	1	8.3	1500	100			
330-339								TOTAL	12	100	13360				

PSD = 83
RSD-P = 16
$\bar{X}$ Wr = 96.7

TOTAL CATCH PER EFFORT OF: GILL NET 12 ELECTROFISHING 0 TRAP NET 0

CATCH COMPOSITION OF: (species) BLACK CRAPPIE LAKE/RESERVOIR: BLUE LAKE (Kootena

DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149	2	50	40	110				440-449							
150-159	1	25	49	107				450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259	1	25	225	89				550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	4	-	354				

TOTAL CATCH PER EFFORT OF: GILL NET 3 ELECTROFISHING 1 TRAP NET 0

Appendix Q. Continued.

CATCH COMPOSITION OF: (species) Brown Bull Head LAKE/RESERVOIR: Blue Lake (Kootenai

DATE: 7/26/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
BATCH	39	30						340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189	3	2.3						480-489							
190-199								490-499							
200-209	9	6.9						500-509							
210-219	7	5.4						510-519							
220-229	15	11.5	155					520-529							
230-239	37	28.5						530-539							
240-249	12	9.2	180					540-549							
250-259	5	3.8						550-559							
260-269	2	1.5						560-569							
270-279								570-579							
280-289	1	0.77	160					580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	130	100	21.45				

TOTAL CATCH PER EFFORT OF: GILL NET 55 ELECTROFISHING 68 TRAP NET 7

Appendix Q. Continued.

CATCH COMPOSITION OF:(species) LNS LAKE/RESERVOIR: BLUE LAKE (Kou-[illegible]

DATE: 7/25/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489							
190-199	1	100						490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	1	100					

TOTAL CATCH PER EFFORT OF: GILL NET 0 ELECTROFISHING 1 TRAP NET 0

CATCH COMPOSITION OF: (species) B/S LSS? LAKE/RESERVOIR: Blue Lake (Kootenai

DATE: 7/29/96 PERIOD:

Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M	Length range (mm)	No. per unit effort	%	mn wt. (gms)	Wr	Age(s)	Maturity ♂ I/M	Maturity ♀ I/M
								340-349							
50-59								350-359							
60-69								360-369							
70-79								370-379							
80-89								380-389							
90-99								390-399							
100-109								400-409							
110-119								410-419							
120-129								420-429							
130-139								430-439							
140-149								440-449							
150-159								450-459							
160-169								460-469							
170-179								470-479							
180-189								480-489	2	100					
190-199								490-499							
200-209								500-509							
210-219								510-519							
220-229								520-529							
230-239								530-539							
240-249								540-549							
250-259								550-559							
260-269								560-569							
270-279								570-579							
280-289								580-589							
290-299								590-599							
300-309								600-609							
310-319								610-619							
320-329								620-629							
330-339								TOTAL	2	100					

TOTAL CATCH PER EFFORT OF: GILL NET 0 ELECTROFISHING 2 TRAP NET 0

Appendix Q. Continued.

FISH COMMUNITY CHARACTERISTICS

LAKE/RESERVOIR NAME: BLUE LAKE (KOOTENAI Co) REGION: 1 DATE: 7/29/96

Catch Per Unit* of Combined Gear Sampling Effort

SPECIES	LENGTH - RANGE(mm)	No.	%	Wt.(kg)	%
LMB	70 - 559	18	4.0	10.815	13.8
Y.P	70 - 229	235	52.5	5.02 *	6.4
N.P	390 - 659	12	2.7	13.360	17.2
B.C	140 - 259	4	0.89	0.354	0.05
P.S	50 - 129	11	2.5	0.13 *	0.02
BH	180 - 289	130	29.0	21.45 *	27.5
	-				
	-				
	-				
	-				
	-				
GAME FISH SUBTOTAL:		265	60.09	57.13	65
	-				
TENCH	120 - 489	39	8.7	24.05 *	30.8
	-				
LNS	190 - 199	1	0.22	0.1 *	0.01
BLS (LSS?)	480 - 489	2	0.45	2.8	3.6
	-				
	-				
	-				
	-				
	-				
	-				
	-				
NON-GAME FISH SUBTOTAL:		183	40.87	26.95	35
ALL SPECIES TOTAL:		448	100%	78.08	100%

*one hour electrofishing, one trap net night, and one combined floating and sinking gill net night.

* estimated weights

1996 ANNUAL PERFORMANCE REPORT

State of:	Idaho	Program:	Fisheries Management F-71-R-21
Project:	I-Surveys and Inventories	Subproject:	I-A Panhandle Region
Job No.:	c	Title:	Rivers and Streams Investigations

Contract Period: July 1, 1996 to June 30, 1997

ABSTRACT

Westslope cutthroat trout, *Oncorhynchus clarki lewisi,* densities estimated from snorkeling transects in the catch-and-release sections of the North Fork Coeur d'Alene, Little North Fork Coeur d'Alene, and St. Joe rivers were 99, 88 and 252 trout/ha, respectively. In the catch-and-keep sections of the same streams densities were 21, 9, and 19 trout/ha, respectively.

Population estimates were calculated for 17 tributaries in the Lake Pend Oreille, Coeur d'Alene Lake and St. Joe River drainages. Trout densities ranged 1.1 to 8.4 fish/100 m2 in the Lake Pend Oreille drainage, 0.4 to 15.1 fish/l00 m2 in the St. Joe River drainage, and 0.32 to 21.1 fish/100 m^2 in the Coeur d'Alene Lake drainage.

Department personnel and volunteers counted 602 bull trout redds in the Lake Pend Oreille drainage in 1996. Forty one bull trout redds were counted in the Upper Priest Lake drainage. In the upper St. Joe River drainage, department personnel and volunteers counted 41 bull trout redds.

Anglers returned 365 questionnaires, 224 from the St. Joe River, 116 from the North Fork Coeur d'Alene River, 12 each from the North Fork St. Joe and Little North Fork Coeur d'Alene rivers and one from the St. Maries River. The mean number of years fished on each river was 10. The majority of anglers fished with flies. However, more anglers used bait on the Coeur d'Alene River than on the St. Joe River.

Creel survey estimates for fishing effort on the St. Joe and North Fork Coeur d'Alene rivers were 28,714 h and 32,994 h, respectively. Hatchery trout harvest was estimated to be 377 and 854 in the St. Joe and North Fork Coeur d'Alene rivers, respectively. Return rates for hatchery trout were 5% and 9% in the St. Joe and North Fork Coeur d'Alene rivers, respectively.

Exploitation of westslope cutthroat trout in both the St. Joe and North Fork Coeur d'Alene rivers was a minimum of 33% based on return of reward tags. The estimated population abundance of westslope cutthroat trout in the entire reach from Pack Saddle Campground to Marble Creek was 97 fish/km. In the area from Pack Saddle Campground downstream to North Fork St. Joe River, the westslope cutthroat trout population abundance was estimated to be 161 fish/km. In the area from the North Fork St. Joe River downstream to Marble Creek, the westslope cutthroat trout population abundance was estimated to be 80 fish/km. This reach is managed to allow for a general bag limit of trout except only one cutthroat trout that must be greater than 350 mm may be harvested.

The highest return rates for a hatchery reared domestic Kamloops rainbow trout, 38%, was from the 305 mm length group in the St. Joe River. The lowest return rate, 22%, came from the 250 mm length group stocked in the North Fork Coeur d'Alene River.

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OBJECTIVES

1. Estimate trout densities in selected snorkeling transects in the Little North Fork Coeur d'Alene and North Fork Coeur d'Alene rivers, and the St. Joe River annually. Compare trends with previously collected data.
2. Estimate population abundance of trout in the St. Joe River by electrofishing.
3. Assess the status of bull trout populations in Lake Pend Oreille, Priest Lake, and St. Joe River drainages based on abundance of bull trout redds in selected tributaries.
4. Determine trout densities in tributaries to Lake Pend Oreille and the St. Joe River.

METHODS

Large River Fish Population Evaluations

Trout Densities

Snorkeling-Biologists snorkeled previously established transects in the North Fork Coeur d'Alene River (NFCDAR) and Little North Fork Coeur d'Alene River (LNFCDAR) (Lewynsky 1986) (Figure 1) and the St. Joe River (SJR) (Rankel 1971) (Figure 2). There were 28, 13, and 35 transects surveyed in NFCDAR, LNFCDAR, and SJR respectively. The number of trout was recorded for each transect by species and length group, either greater than 300 mm or less than 300 mm. Mountain whitefish, *Prosopium williamsoni*, were counted as either adults or juveniles. Squawfish, *Ptychocheilus oregonensis*, and suckers, *Catostomus* spp., were enumerated. Density estimates were calculated for westslope cutthroat trout, *Oncorhynchus clarki lewisi,* bull trout, *Salvelinus confluentus,* and rainbow trout, *O. mykiss*.

The length and width (m) of each transect was measured to determine the area (m^2) surveyed. Trout density was reported as fish/m^2, fish/100 m^2 and fish/ha.

Electrofishing-SJR from Packsaddle campground downstream to Fall Creek (Figure 3) and the Coeur d'Alene River (CDAR) and NFCDAR from Kit Price campground downstream to Cataldo, Idaho (Figure 4) were electrofished June 17-19, 1996 and June 11-12 and 25, 1996, respectively. All trout were collected using a Colfelt VVP 15 and a 5000 watt generator mounted in a driftboat with electrodes suspended from two forward booms. The driftboat floated downstream adjacent to the bank. All collected trout were measured for total length (mm TL), marked with a hole punched into the caudal fin and released. Trout 350 mm TL or longer were tagged with a numbered floy tag. A second recapture run was conducted on the SJR from Packsaddle campground to Marble Creek on June 26, 1996 and on the NFCDAR from the Steel Bridge (downstream from Beaver Creek) downstream to Graham Creek campground June 28, 1996. All collected trout were examined for a mark, measured for total length and released. Any trout over 350 mm TL were

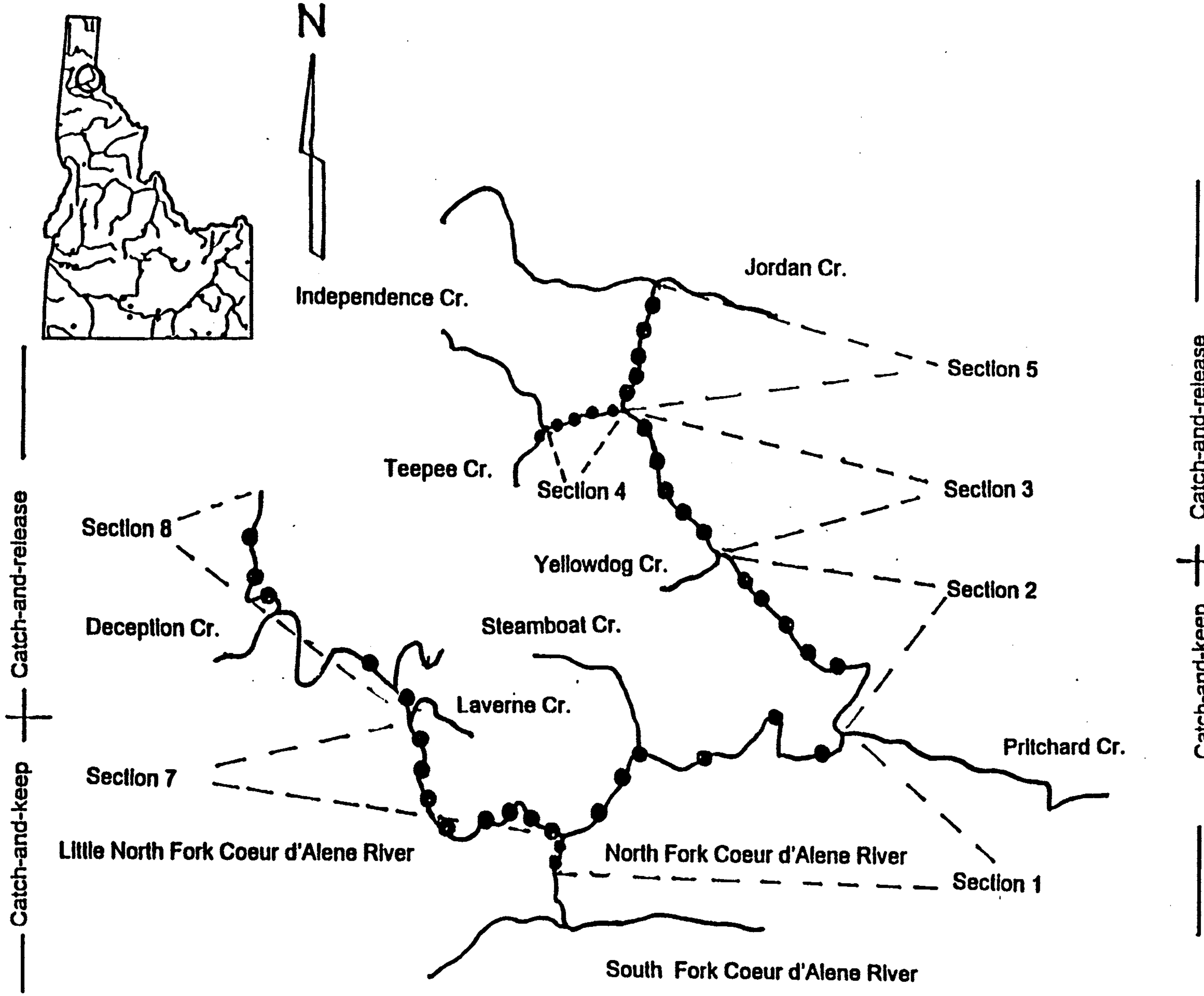

Figure 1. General location of snorkeling transects in the North Fork and Little North Fork Coeur d'Alene rivers, Idaho.

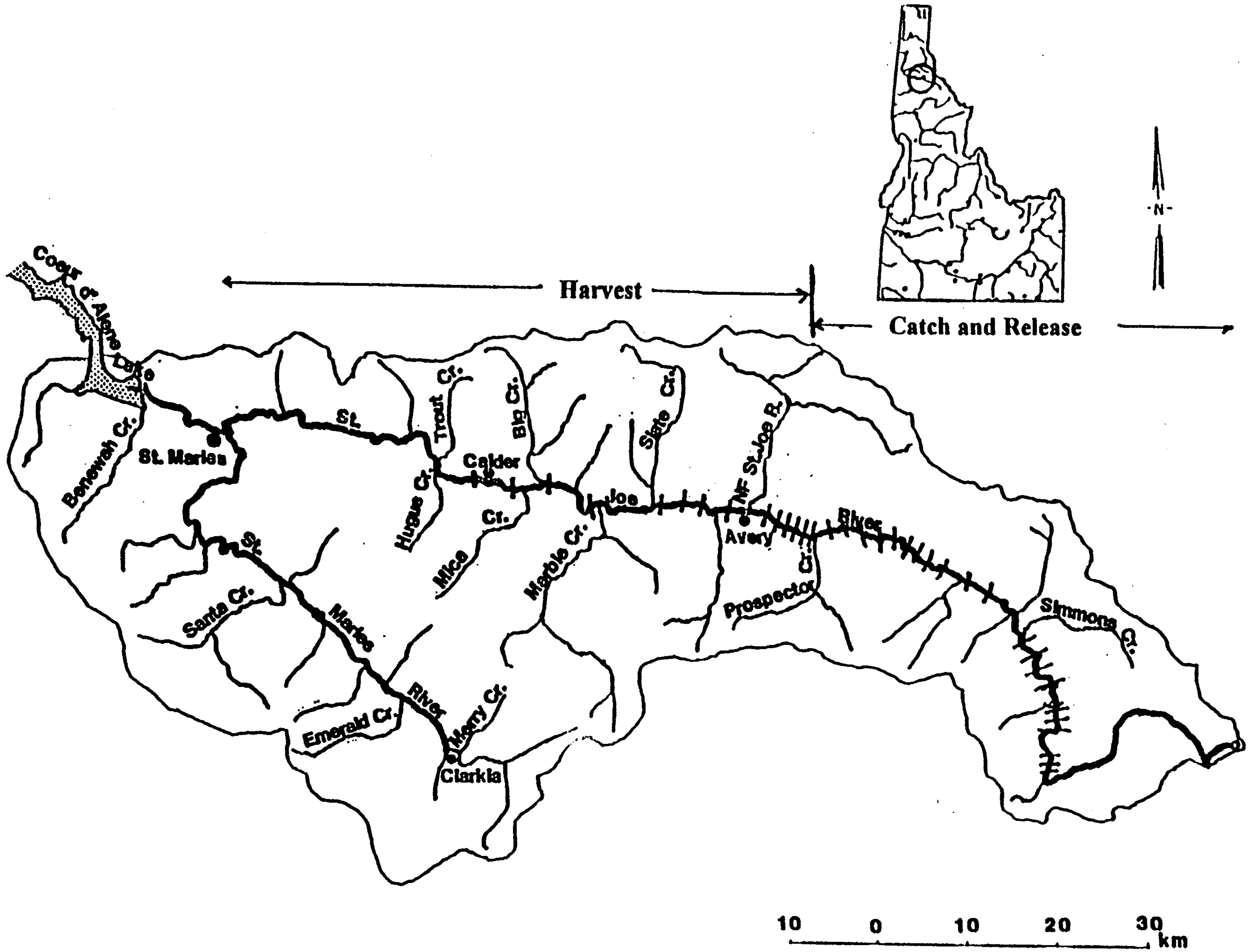

Figure 2. General locations of snorkeling transects on the St. Joe River, Idaho.

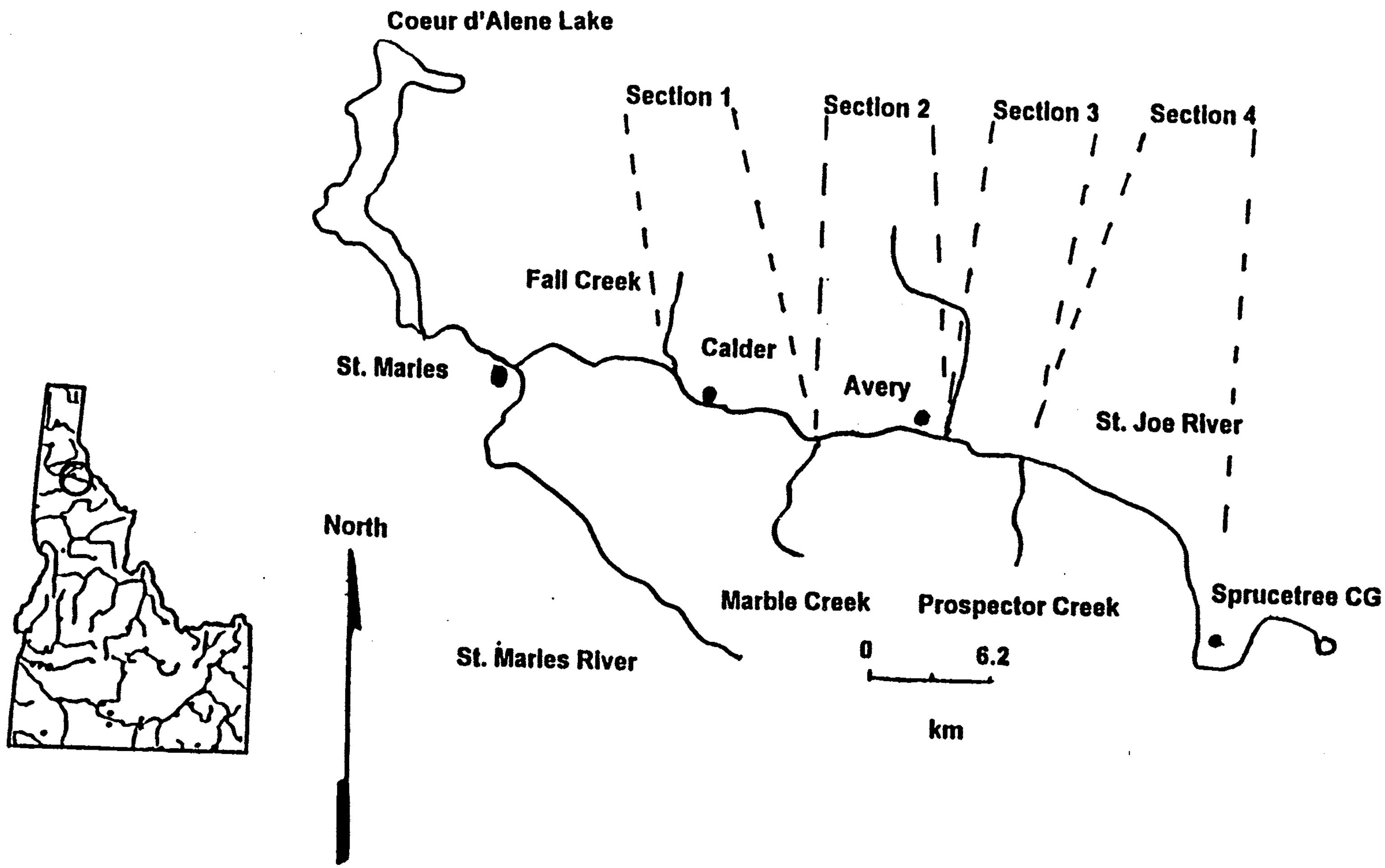

Figure 3. General location of creel survey and electrofishing sections on the St. Joe River, Idaho, 1996.

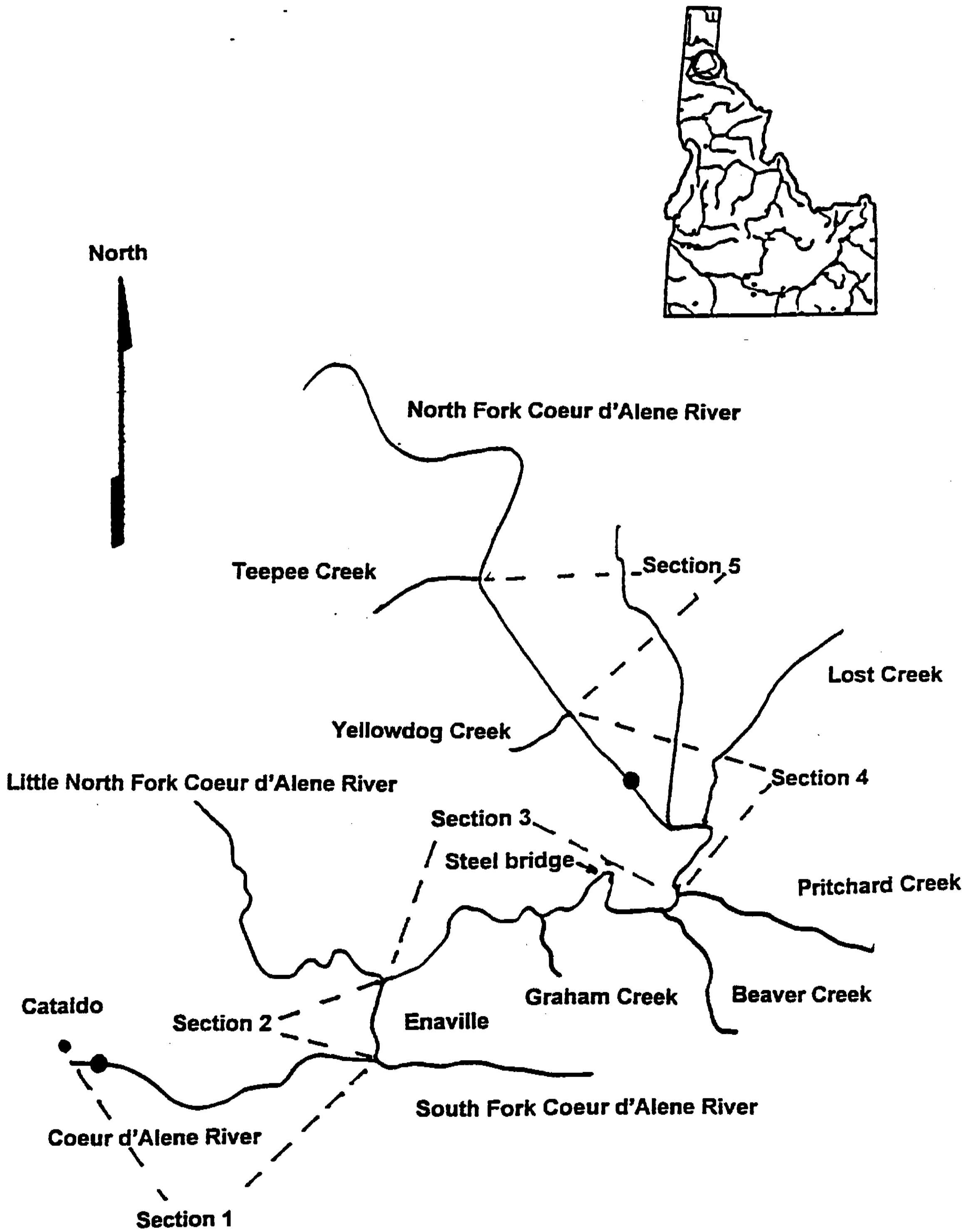

Figure 4. General location of creel survey and electrofishing sections on the Coeur d'Alene and North Fork Coeur d'Alene rivers, Idaho, 1996.

tagged with a numbered floy tag. A Peterson population estimate (Ricker 1975) was calculated when enough marked fish were recaptured. Tag returns from bull trout were used to determine migration distances.

Tributary Evaluations

Standard Stream Surveys

Two groups of streams, based on channel types (Rosgen 1985) were surveyed in 1996. Tributaries surveyed in the Lake Pend Orielle (LPO) drainage were channel type 'B'. The second group of streams were 'C' channel types. The Idaho Department of Fish and Game 'Standard Stream Survey' guidelines (Davis et al., 1997) were followed for eight streams in the Lake Pend Orielle (LPO) and Coeur d'Alene Lake (CDAL) drainages. Habitat parameters, length, width, depth (m), gradient (%) and substrate composition were measured and recorded for each reach.

Fish Population Estimates

Fish population estimates made by using a depletion method (Seber and Le Cren 1967) were calculated for 17 streams in the LPO, CDAL, and SJR drainages. A backpack electrofishing unit, Colfelt BP-4, and one or two netters were used to collect fish. One to four stream transects were systematically selected in each stream beginning at the mouth and progressing upstream every 800 m. Two or three passes were made to collect fish. Length TL measurements were recorded for all fish collected. Scale samples were taken from westslope cutthroat trout from several streams. Population estimates were expressed as a point estimate and as fish/100 m^2.

Bull Trout Spawning Surveys

Bull trout redds were counted in selected tributaries of the LPO, Upper Priest Lake, SJR, and Little North Fork Clearwater River (LNFCR) drainages in 1996. Survey techniques and identification of bull trout redds followed methodology described by Pratt (1984).

Five index streams were selected in the SJR drainage to begin long term monitoring, Medicine, Wisdom, and California creeks, and the St. Joe River from Heller Creek upstream to Medicine Creek and the St. Joe River from Medicine Creek upstream to the cascade below St. Joe Lake. These streams were also selected to compare redd counts completed by volunteers with those counted by trained biologists. Interpretation of the resulting redd counts must be carefully considered.

The Bureau of Land Management and the Idaho Department of Fish and Game cooperated in a cost share program to conduct a bull trout redd survey in four tributaries of the LNFCR and the upper portion of the LNFCR. The goal of the study was to document and quantify bull trout spawning.

Fishery Evaluation

Angler Opinion Survey

The Spokane River drainage angler opinion survey was a modified Dillman (1978) design. A creel survey clerk would contact anglers fishing the St. Joe or Coeur d'Alene drainages. After collecting harvest data, the clerk asked if the angler was willing to participate in a mail survey about fishery management in the drainage where the angler was fishing. If the angler agreed to participate, the angler was asked to fill out a numbered address label. The control number on the label was entered next the angler harvest information. The addresses were photo copied and entered into a database. The address label was placed on a questionnaire for the appropriate river and mailed to the angler. If the questionnaire was not returned by the fourth week, a postcard reminder was sent to the supplied address asking if the angler needed another questionnaire and to return the completed questionnaire as soon as possible. The completed questionnaires were summarized by river and by river section.

Questionnaires were developed for the following rivers, CDAR-NFCDAR, LNFCAR, SJR, North Fork St. Joe River (NFSJR) and Marble Creek, and St. Maries River (SMR). The questions in the questionnaires were divided into seven sections. The sections pertained to: fishery management of the river, general angler attitudes, fishery management of the harvest area, fishery management of the tributaries in the harvest area, guided fishing trips, assessment of the Idaho Department of Fish and Game's ability to manage fishery resources, and angler demographics (Appendices A-D).

Creel Survey

A creel survey was conducted on the SJR, CDAR, and NFCDAR from May 25 to September 10, 1996. The sampling period was divided into four 28-day intervals. Fifteen days were randomly selected as survey days, 10 weekend days and 5 weekdays. Two angler counts were made each day. Start times were randomly selected between 0600 and 1100, with the second angler count six hours later. Angler interviews were conducted between count times. Number of anglers, number of each species of trout kept or released and number of hours fished were recorded for each interview.

Data were collected for each section separately. The CDAR and NFCDAR were divided into five sections beginning at Cataldo, Idaho and ending upstream at the confluence of Teepee Creek (Figure 4). The SJR was divided into four sections beginning at Fall Creek and ending upstream at Spruce Tree campground (Figure 3).

Exploitation of Tagged Fish

Westslope Cutthroat Trout-Minimum exploitation estimates were calculated from tags returned from westslope cutthroat trout harvested from the SJR and CDAR-NFCDAR. A reward of a T-shirt, hat or $5.00, was offered for the return of tag numbers. A $100.00 gift certificate was offered as additional incentive to return tags. All returned tags were entered into a drawing for the gift certificate. The drawing was held in late October 1996.

Hatchery Rainbow Trout - Domestic Kamloops rainbow trout were divided into paired groups of 500 fish each. Two groups were raised to a length of 250 mm TL, with two groups raised to 305 mm TL. Each group was measured for total length to eliminate any fish outside the length parameters; fish were captured, anesthetized with CO_2, and marked with an adipose fin clip so a harvest estimate could be calculated for the first 10 days following stocking. The first 100 fish measured from each group were tagged with a numbered floy tag so a minimum return rate could be calculated. Caps, T-shirts, or $5.00 were offered for the return of tag numbers. All returned tags were entered into a drawing for a $100.00 gift certificate. The drawing was held in late October 1996.

Paired groups were stocked into the NFCDAR on June 21 and 24, 1996 and into the SJR on 13 July 1996. An intensive creel survey was conducted for 10 days following stocking of each paired group. Each day department personnel made two angler counts and interviewed anglers to collect harvest information, hours fished, fish caught and number of anglers. Harvest estimates for each group of stocked trout were calculated.

RESULTS

Large River Fish Population Evaluation

Cutthroat Trout Densities

North Fork Coeur d'Alene River

Snorkeling-The estimated density of westslope cutthroat trout was 90 fish/ha and 21 fish/ha in the catch-and-release and the catch-and-keep sections, respectively (Table 1). Summaries of fish observed and fish densities per transect are displayed in Appendices E and F. The density of trout larger than 300 mm TL was higher in the catch-and-release section (14 fish/ha) than in the catch-and-keep section (2 fish/ha), where a one cutthroat trout, 14 inch minimum size regulation was in effect (Figure 5).

Electrofishing-We were unable to recapture enough marked fish to calculate a population estimate for the NFCDAR. The 68 cutthroat trout caught ranged in length from 100 - 482 mm TL (Figure 6). Trout species composition included; cutthroat, rainbow, rainbow x cutthroat hybrids and brook trout, *Salvelinus fontinalis* (Figure 7).

Little North Fork Coeur d'Alene River

Snorkeling-The estimated density of westslope cutthroat trout was 88 fish/ha in the catch-and-release section and 9 fish/ha in the catch-and-keep section, respectively (Table 1). No cutthroat trout larger than 300 mm were observed in the LNFCDAR (Figure 5). Appendix G displays the number of fish observed and the density per transect.

St. Joe River

Snorkeling-Estimated densities of westslope cutthroat trout were 252 fish/ha and 19 fish/ha in the catch-and-release and the catch-and-keep sections of the SJR, respectively (Table 1). The density of cutthroat trout greater than 300 mm was 62 fish/ha and 4 fish/ha in the catch-and-release and the catch-and-keep sections of the SJR, respectively (Figure 5). A summary of fish observed and estimated fish densities for each transect are displayed in Appendices H and I.

Electrofishing-The population estimate for westslope cutthroat trout in the SJR from Packsaddle campground downstream to Marble Creek was 2,495 or 97 fish/km. The population estimate from Packsaddle campground downstream to North Fork St. Joe River was 1,031 or 161 fish/km. The population estimate from North Fork St. Joe River downstream to Marble Creek was 1,404 or 80 fish/km. The 371 westslope cutthroat captured ranged from 117 - 453 mm TL (Figure 8). Trout species composition included; cutthroat, rainbow, cutthroat X rainbow hybrids and bull trout (Figure 7).

Table 1. Summary of westslope cutthroat trout densities counted in snorkeling transects in the North Fork Coeur d'Alene, Little North Fork Coeur d'Alene and the St. Joe rivers, Idaho, August 1996.

North Fork Coeur d'Alene River

Section	Fish Size	Cutthroat counted	Transect length (km)	Number counted/ km	Area (ha)	No. counted/ ha
Catch-and-keep	≤ 300 mm	115	1.95	59	5.9	19
	> 300 mm	9	1.95	5	5.9	2
				64		21
Catch-and-release	≤ 300 mm	187	1.4	133	2.2	85
	> 300 mm	31	1.4	22	2.2	14
				155		99

Little North Fork Coeur d'Alene River

	Fish Size	Cutthroat counted	Transect length (km)	Number counted/ km	Area (ha)	No. counted/ ha
Catch-and-keep	≤ 300 mm	11	0.81	14	1.3	8
	> 300 mm	1	0.81	1	1.6	1
				15		9
Catch-and-release	≤ 300 mm	33	0.33	100	0.40	83
	> 300 mm	2	0.33	6	0.40	5
				106		88

Table 1. Continued.

St. Joe River

Section	Fish Size	Cutthroat counted	Transect length (km)	Number counted/ km	Area (ha)	No. counted/ ha
Catch-and-keep	≤ 300 mm	83	1.6	52	5.6	15
	> 300 mm	21	1.6	13	5.6	4
				65		19
Catch-and- release	≤ 300 mm	647	1.8	359	3.4	190
	> 300 mm	210	1.8	117	3.4	62
				476		252

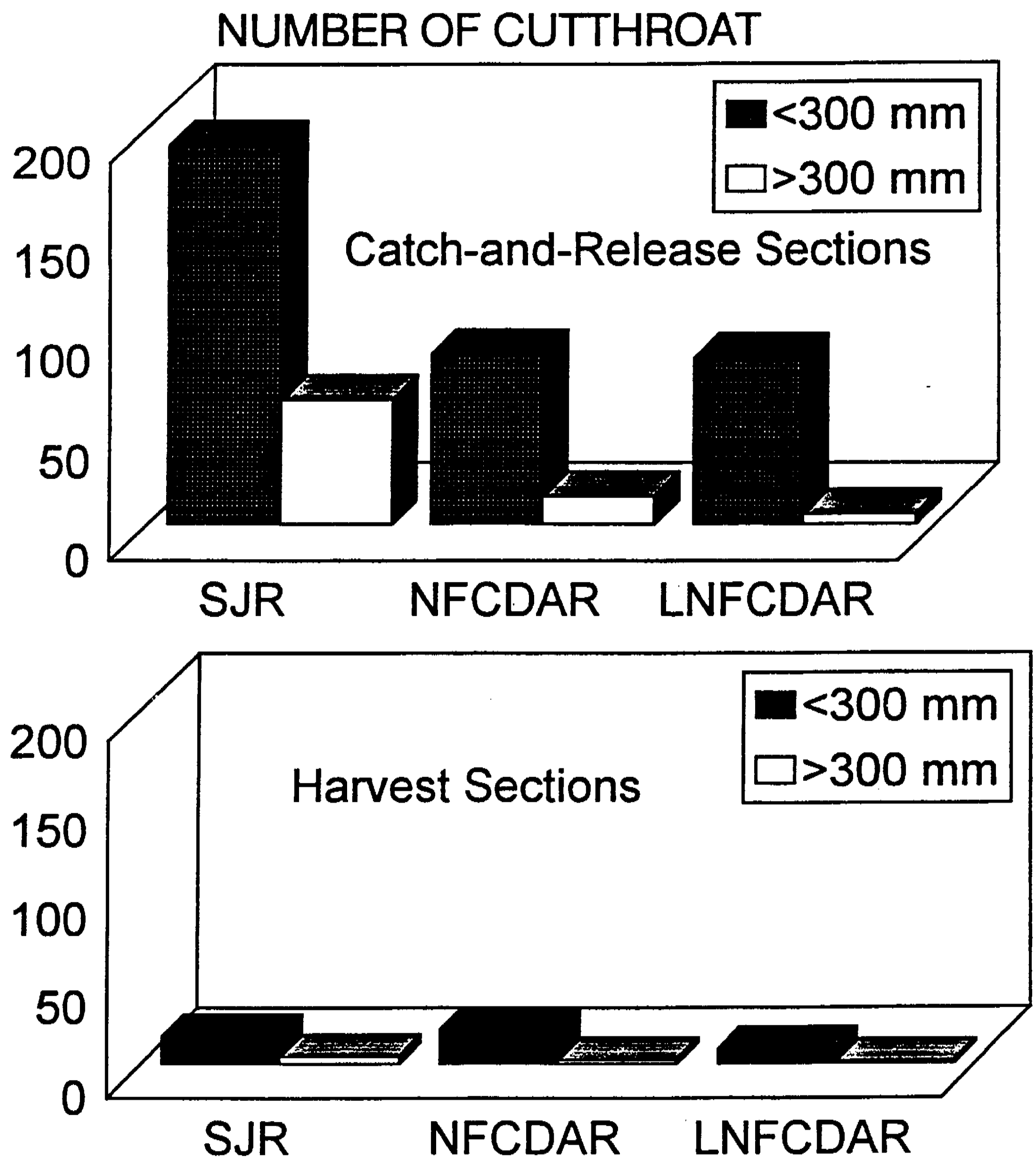

Figure 5. Number of westslope cutthroat trout observed by snorkeling classified as either greater than 300 mm or less than 300 mm in the catch-and-release and harvest segment of the North Fork Coeur d'Alene River (NFCDAR), Little North Fork Coeur d'Alene River (LNFCDAR), and St. Joe River (SJR), Idaho, 1996.

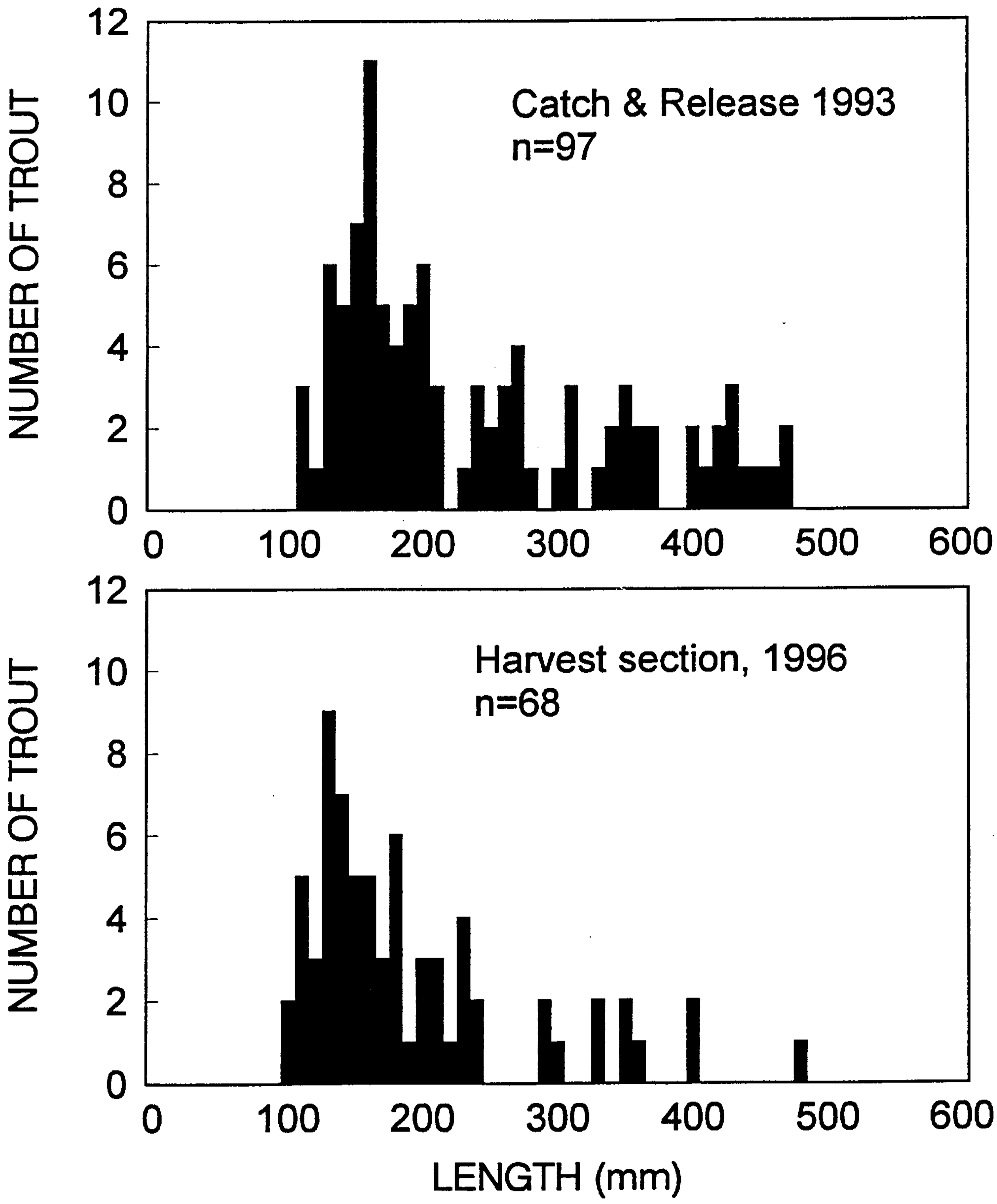

Figure 6. Population structure for westslope cutthroat trout collected by electrofishing in the North Fork Coeur d'Alene River, Idaho, 1993 and 1996.

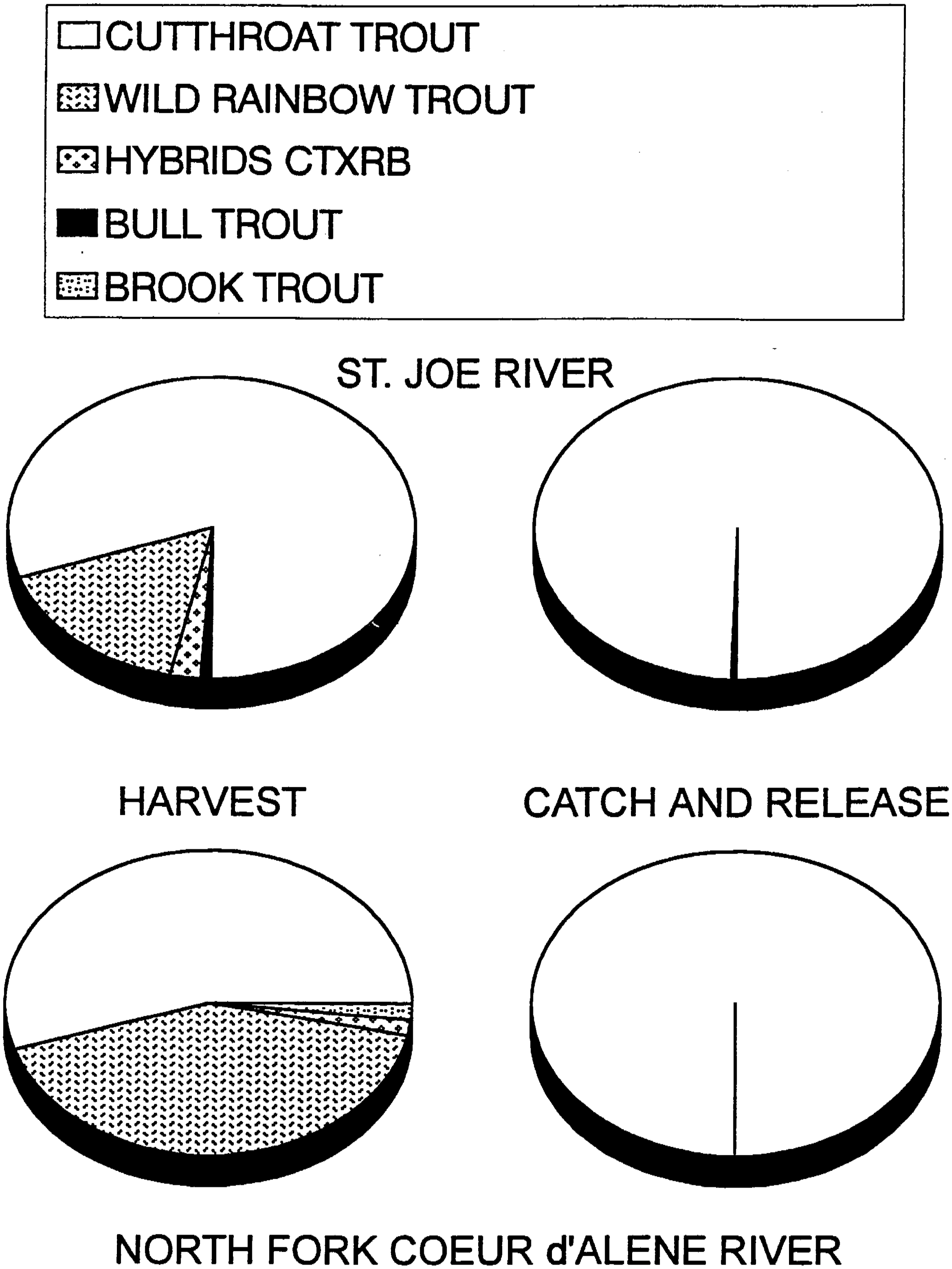

Figure 7. Trout species composition collected by electrofishing in the St. Joe and North Fork Coeur d'Alene rivers, Idaho. The harvest data was collected in 1996, SJR catch-and-release data was collected in 1995, NFCDAR catch-and-release data was collected in 1993.

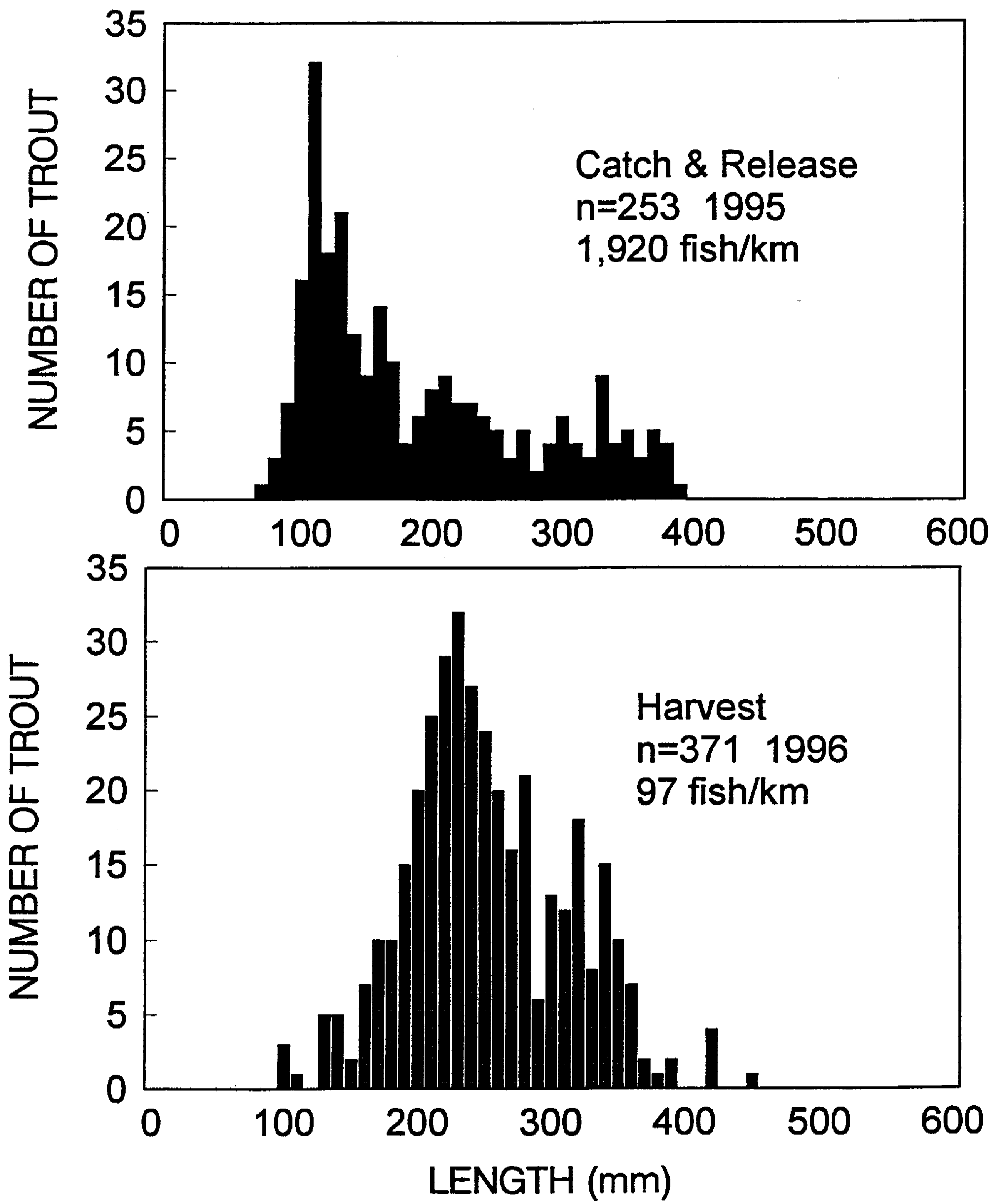

Figure 8. Size structure of westslope cutthroat trout collected by electrofishing in the St. Joe River, Idaho, 1995 and 1996.

Bull Trout Densities

Snorkeling-Bull trout were observed in only two transects in the SJR (Appendix H). Both observations were in the catch-and-release section of the river between Hardpan Creek and Niagra Creek. No bull trout were observed in the NFCDAR or the LNFCDAR.

Electrofishing -Three bull trout were tagged in the SJR while electrofishing, 485 mm, 570 mm and 595 mm TL. Two fish were collected above the confluence with the NFSJR and one below. Volunteers observed a tagged bull trout caught by an angler near Game Creek on September 28, 1996; a tag number was recorded and the fish released. Game Creek is located 2 km above Spruce Tree Campground and 27 km above the tagging site for this bull trout. This was likely a minimum distance traveled to the spawning stream because the fish was probably migrating downstream after spawning. No bull trout were collected from the CDAR-NFCDAR in 1996.

Rainbow Trout Densities

Snorkeling-Natural, "wild", rainbow trout were observed in NFCDAR from Teepee Creek downstream (Appendix E). Most of the 137 rainbow trout observed occurred from Pritchard Creek downstream. Densities ranged from 0 - 1.0 fish/100 m^2 (Appendix F). Ten percent of the 137 rainbow trout observed were greater than 300 mm TL.

Natural rainbow trout were also observed in the LNFCDAR. Densities ranged 0.07 to 2.24 fish/100 m^2. One transect had 19 rainbow trout present and density of 2.24 fish/100 m^2 (Appendix G). Only two of the 30 rainbow trout observed were over 300 mm TL.

Natural rainbow trout in the SJR were observed as far upstream as Ruby Creek which, is 8 km upstream from Spruce Tree Campground in the roadless catch-and-release section. Nine percent of the 103 rainbow trout observed were greater than 300 mm TL (Appendix H).

Electrofishing-Only one rainbow trout was tagged in each of the CDAR-NFCDAR and SJR. Neither tag was returned. Not enough marked rainbow trout were recaptured from the SJR or the CDAR-NFCDAR to calculate a population estimate. Lengths of captured rainbow trout ranged from 90 to 360 mm TL in the CDAR-NFCDAR and 100 to 340 mm TL in the SJR.

Tributary Evaluations

Standard Stream Surveys

Gravel, rubble and boulders dominated the substrate composition in LPO tributaries (Table 2). These stream reaches generally contained low percentages of sand, except for Porcupine Creek (Table 2). Riffle and run/glide habitat were the most abundant habitat types present in several tributaries (Table 2). Pool and

Table 2. Habitat description for eight northern Idaho streams surveyed in 1996.

Stream	Transect number	Channel type	Gradient (%)	Length (m)	Width (m)	Mean depth (m)	Percent substrate class range					Percent habitat type			
							Sand	Gravel	Rubble	Boulder	Bedrock	Pool	Riffle	Run\ glide	Pocket water
Lake Pend Oreille drainage															
East Fork Lightening Cr.	1	B	2	75	16.3	0.5	0	5-80	15-90	5-75	0	20	0	0	80
	2	B	2	72	9	0.27	0	0	0-60	40-100	0	5	20	20	55
Char Cr.	1	B	2	110	5.3	0.18	0-15	0-30	10-90	0-75	0	5	20	0	75
Rattle Cr.	1	B	2	117	7.2	0.35	0	0-70	20-80	0-80	0	40	50	10	0
	2	B	2	52	6.5	0.27	0-20	0-80	20-80	0-50	0	60	30	10	0
Porcupine Cr.	1	B	2	93	7.1	0.14	0-50	10-50	0-70	0-70	0	30	60	5	5
	2	B	0.3	72	6.7	0.19	20-70	20-70	0-60	0-60	0	40	50	10	0
North Gold Cr.	1	B	--	110	5.7	0.15	0	10-100	0-90	0-5	0	30	40	20	10
St. Maries River drainage															
Merry Cr.	1	C	2	79	5.8	0.18	0-70	30-80	0-40	0	0	20	60	20	0
	2	C	--	83	4.7	0.21	80-100	0-20	0	0	0	30	50	20	0
Coeur d'Alene Lake drainage															
Wolf Lodge Cr.	1	C	1	142	11	0.1	30-70	20-70	0-10	0	0	5	95	0	0
Searchlight Cr.	1	C	--	74	1.8	0.14	50-90	10-50	0	0	0	20	70	10	0

pocket water habitat types, which may be linked to trout survival, were most abundant in Char and East Fork Lightning creeks (Table 2).

Wolf Lodge and Searchlight creeks in the Coeur d'Alene Lake drainage and Merry Creek in the headwaters of the St. Maries River drainage were classified as 'C' channel types.. The major sediment component was sand. Riffles and run/glides were the major habitat types (Table 2).

Very little large woody debris were found in any of the stream reaches surveyed. Searchlight Creek had the most overhanging cover.

Fish Populations

Trout population estimates were calculated for 17 streams in four drainages in 1996 (Table 3). Population estimates for the streams in the LPO drainage ranged 8 to 47 trout per reach (Table 3). Trout densities ranged from 1.1 to 8.4 fish/100 m^2 (Table 3). Bull trout ranging in length from 60 to 660 mm were found in the six LPO drainage tributaries (Figure 9). Very few young-of-the-year (YOY) bull trout were found (Figure 9). Cutthroat, rainbow and brook trout were present in some of the tributaries (Figures 10 and 11).

Electrofishing in the St. Joe River drainage tributaries provided density estimates ranging from ranging 0.4 to 15.1 fish/100 m^2 (Table 3). Cutthroat trout were the only trout collected in all the tributaries except for one bull trout in Skookum Creek (Figure 12). Many cutthroat trout YOY were collected from several tributaries (Figures 12, 13 ,14).

Two tributaries in the Coeur d'Alene Lake drainage were surveyed - Wolf Lodge and Searchlight creeks. Density estimates for Wolf Lodge and Searchlight creeks were 0.3 fish/ 100 m^2 and 21.1 fish/ 100 m^2, respectively. (Table 3). Most of the trout in Searchlight Creek were cutthroat trout ranging in length from 50 to 170 mm TL (Figure 15). Most of the trout in Wolf Lodge Creek were brook trout ranging in length form 30 to 220 mm TL (Figure 15).

Merry Creek was the only tributary in the St. Maries River drainage surveyed in 1996. Trout population estimates in transect one and two were five and 18, respectively (Table 3). Cutthroat trout were the only trout collected and ranged in length from 80 to 230 mm TL (Figure 16).

Bull Trout Spawning Surveys

Lake Pend Oreille Drainage

The 602 bull trout redds counted in the LPO drainage in 1996 were slightly less than the 9-year average of 627 (Table 4). The redd count for the six index streams, which totaled 486, was slightly higher than the 13-year average of 475. Using the expansion factor of 3.2 fish/redd (Fraley et al. 1981), an estimated 1,555 bull trout entered the six index streams. The estimated spawning escapement for bull trout in the 20 streams surveyed in the LPO drainage in 1996 was 1,946.

Table 3. Trout population estimates and densities for trout greater than 80 mm in length in 17 streams located in northern Idaho, 1996.

Stream	Transect	Channel type	Length (m)	Mean width (m)	Species present	Area (m^2)	Number of trout collected Pass 1	Pass 2	Pass 3	Population estimate	Population estimate 95% C.I.	Density fish\100 m^2
Lake Pend Oreille drainage												
East Fork Lightening Cr.	1	B	75	16.3	Rb,Bt,Ct	1223	6	5	2	14	13 to 19	1.1
	2	B	72	9	Rb,Bt,Ct	648	7	5	--	15	12 to 27	2.3
Char Cr.	1	B	110	5.3	Rb,Ct,Bt,	583	16	9	3	30	28 to 35	5.2
Rattle Cr.	2	B	52	6.5	Bt,Rb	338	5	3	--	8	8 to 11	2.4
Porcupine Cr.	1	B	93	7.1	Ct,Rb,Bt,	660	14	2	--	16	16 to 17	2.4
	2	B	72	6.7	& Bk	482	5	2	--	7	7 to 9	1.5
North Fork Grouse Cr.	1	B	100	5.6	Rb,Bk,Bt	560	18	18	4	47	40 to 60	8.4
North Gold Cr.	1	B	110	5.7	Ct,Bt,Rb	627	11	12	4	35	27 to 53	5.6
Coeur d'Alene Lake drainage												
Wolf Lodge Cr.	1	C	142	11	Bk,Ct	1562	3	2	--	5	5 to 8	0.32
Searchlight Cr.	1	C	74	1.8	Ct,Bk	133	15	8	--	28	23 to 41	21.1
St. Maries River drainage												
Merry Cr.	1	C	79	5.8	Ct	458	3	2	--	5	5 to 8	1.1
	2	C	83	4.7	Ct	390	14	4	--	18	18 to 20	4.6

Table 3. Continued.

Stream	Transect	Channel type	Length (m)	Mean width (m)	Species present	Area (m^2)	Number of trout collected Pass 1	Pass 2	Pass 3	Population estimate	Population estimate 95%C.I.	Density fish\100 m^2
St. Joe River drainage												
Big Cr.	1	C	115	13.8		1587	0	0	0			
	2	C	80	8.5		680	0	0	0			
	3	B	84	8.4	Ct	706	2	1	--	3	3 to 6	0.42
	4	B	61	5.8	Ct	354	4	1	--	5	5 to 6	1.4
Quartz Cr.	1	B	46	6.4	Ct	294	7	--	--	--		
	2	B	44	4.5	Ct	198	4	1	--	5	5 to 6	2.5
	3	B	60	6.9	Ct	414	11	5	--	17	16 to 22	4.1
	4	B	41	6.6	Ct	271	6	5	--	16	11 to 38	5.9
Bird Cr.	1	B	51	4.8	Ct	245	21	10	--	37	31 to 51	15.1
	2	A	48	6.1	Ct	293	33	7	--	41	40 to 45	14
	3	A	72	6.4	Ct	461	11	7	--	23	18 to 39	5
	4	A	69	4.3	Ct	297	32	5	--	37	37 to 39	12.5
Gold Cr.	1	B	57	8.1	Ct	458	13	13	1	29	27 to 35	6.3
Simmons Cr.	1	B	35	8.2	Ct	285	13	2	--	15	15 to 16	5.3
	2	B	73	11.1	Ct	803	23	11	--	41	34 to 56	5.1
	3	B	45	12	Ct	540	24	7	--	32	31 to 36	5.9
Indian Cr.	1	B	24	3.1	Ct	749	6	1	--	7	7 to 8	9.5
Skookum Cr.	1	A	59	5.4	Ct,Bt	319	7	6	1	14	14 to 17	4.4

Ct=cutthroat trout; Rb=rainbow trout; Bt=bull trout; Bk=brook trout

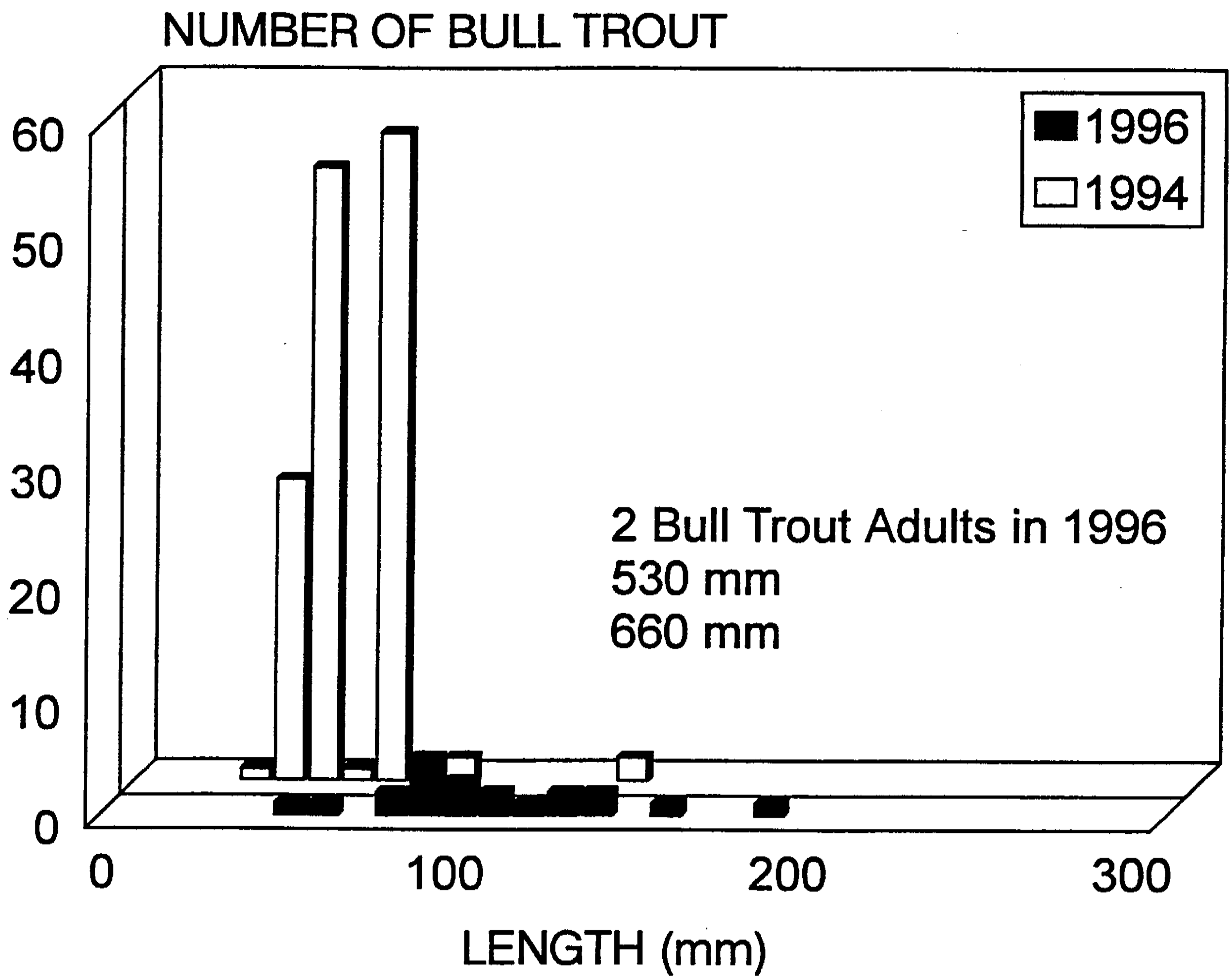

Figure 9. Length frequencies of bull trout collected in the Lake Pend Oreille, Idaho, drainage by electrofishing in six tributaries (East Fork Lightning, Char, Rattle, Porcupine, North Gold and North Fork Grouse creeks) in 1996, compared to data collected by Division of Environmental Quality in 1994 from tributaries in the Lightning Creek drainage.

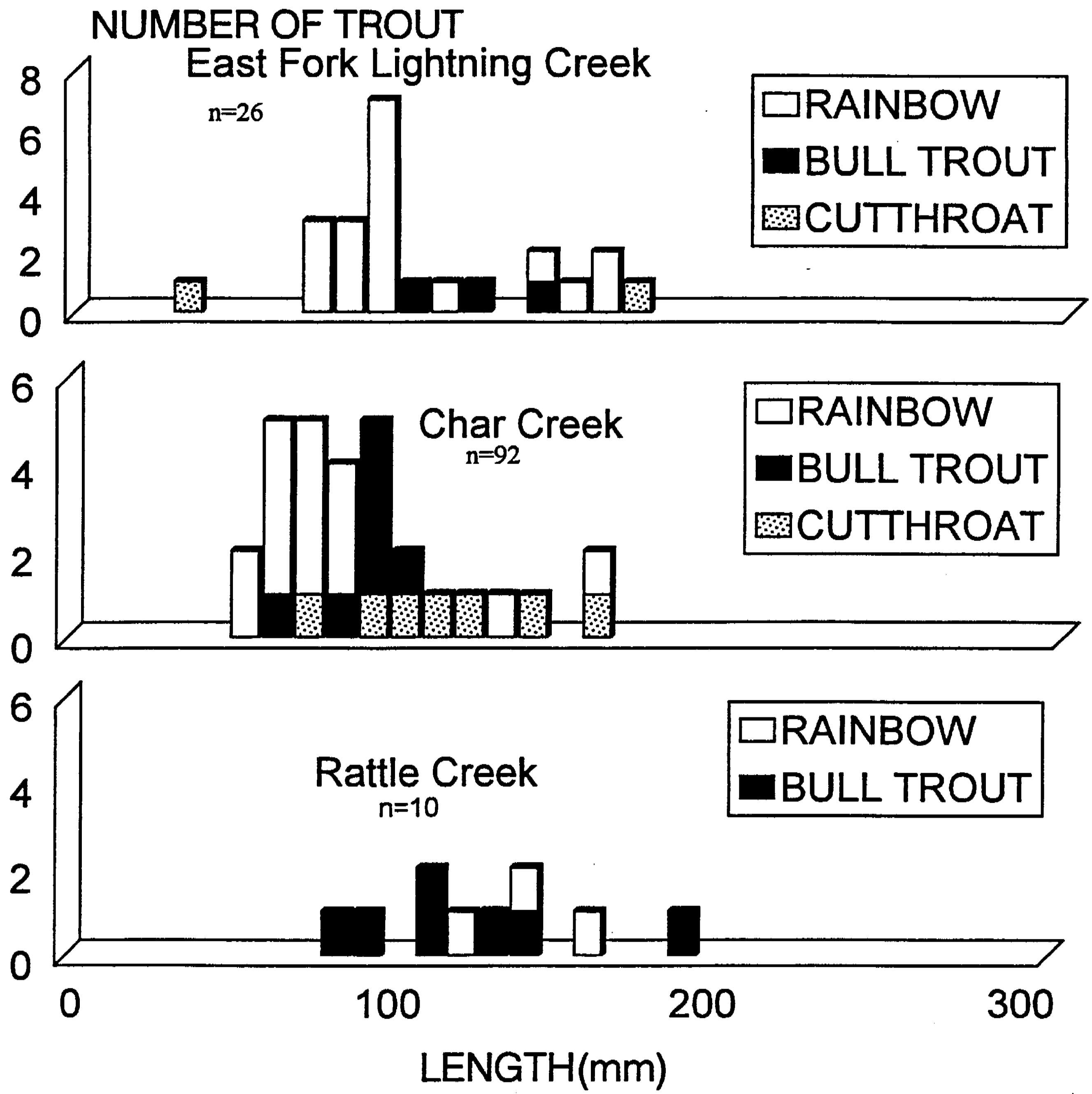

Figure 10. Trout species composition and length frequencies of fish collected by electrofishing East Fork Lightning, Char, and Rattle creeks, tributaries to Lake Pend Oreille, Idaho, 1996.

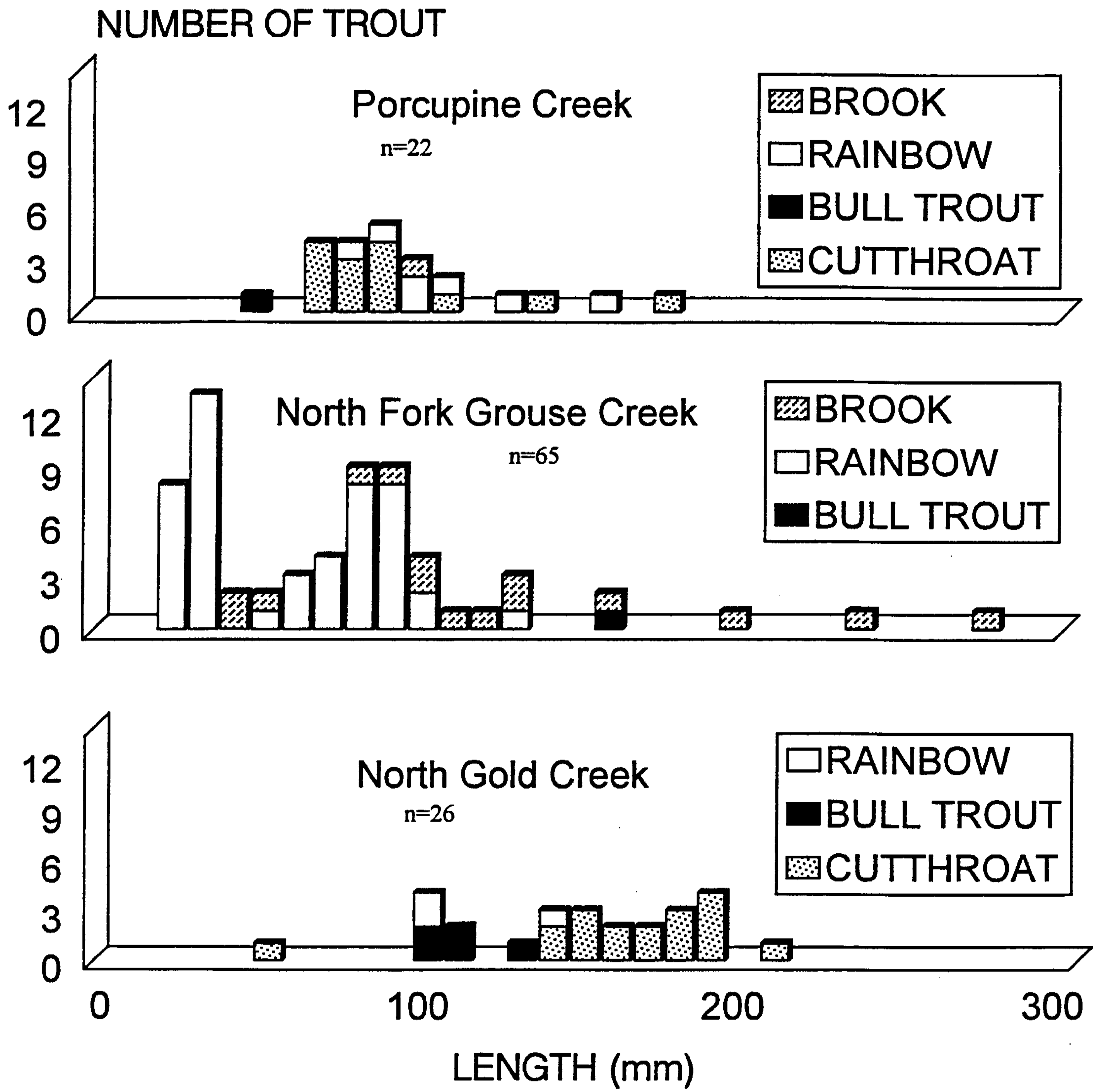

Figure 11. Trout species composition and length frequencies of fish collected by electrofishing Porcupine, North Fork Grouse and North Gold creeks, tributaries to Lake Pend Oreille, Idaho, 1996.

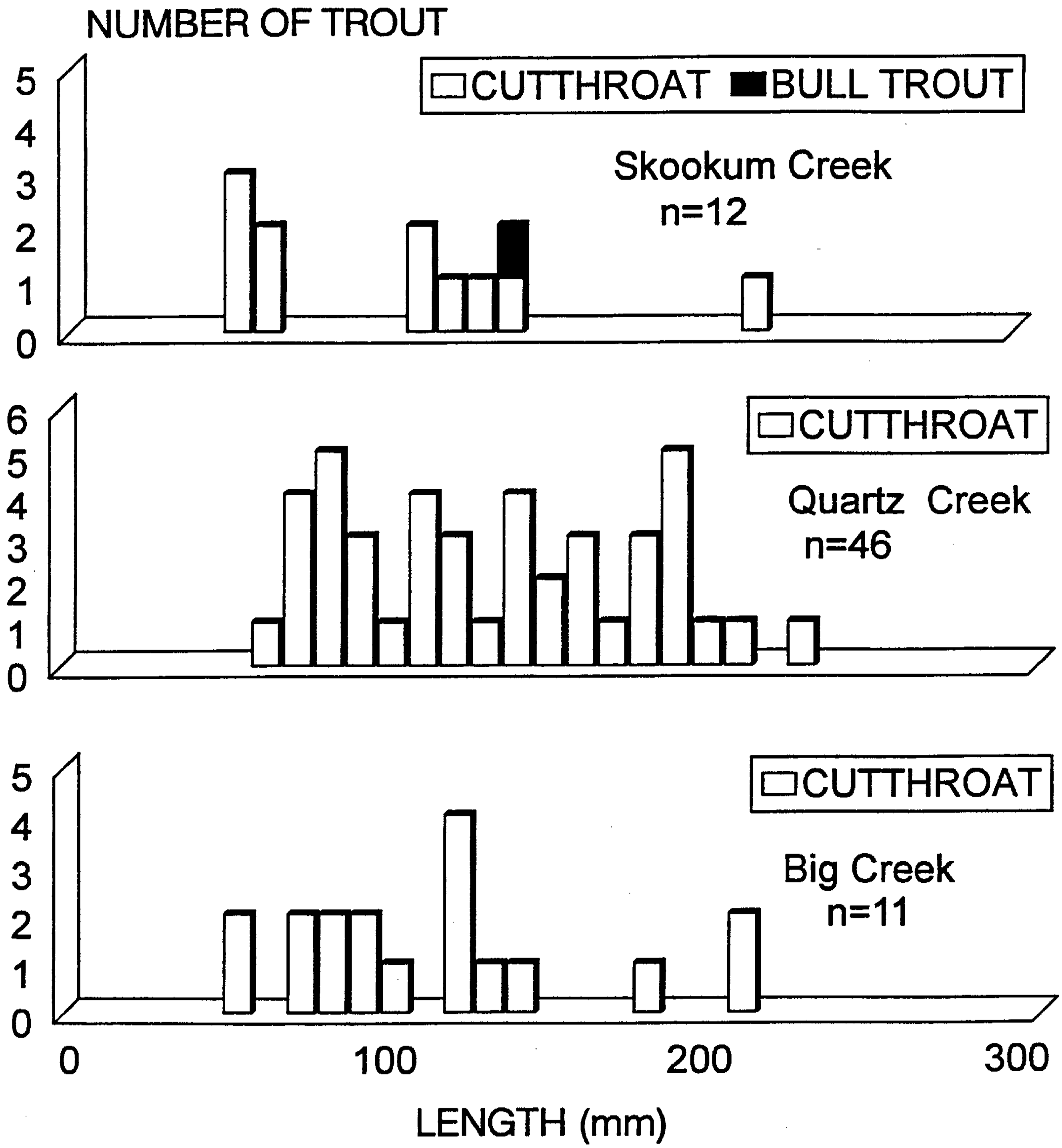

Figure 12. Length frequencies of trout sampled by electrofishing Skookum, Quartz and Big creeks, tributaries to the St. Joe River, Idaho, 1996.

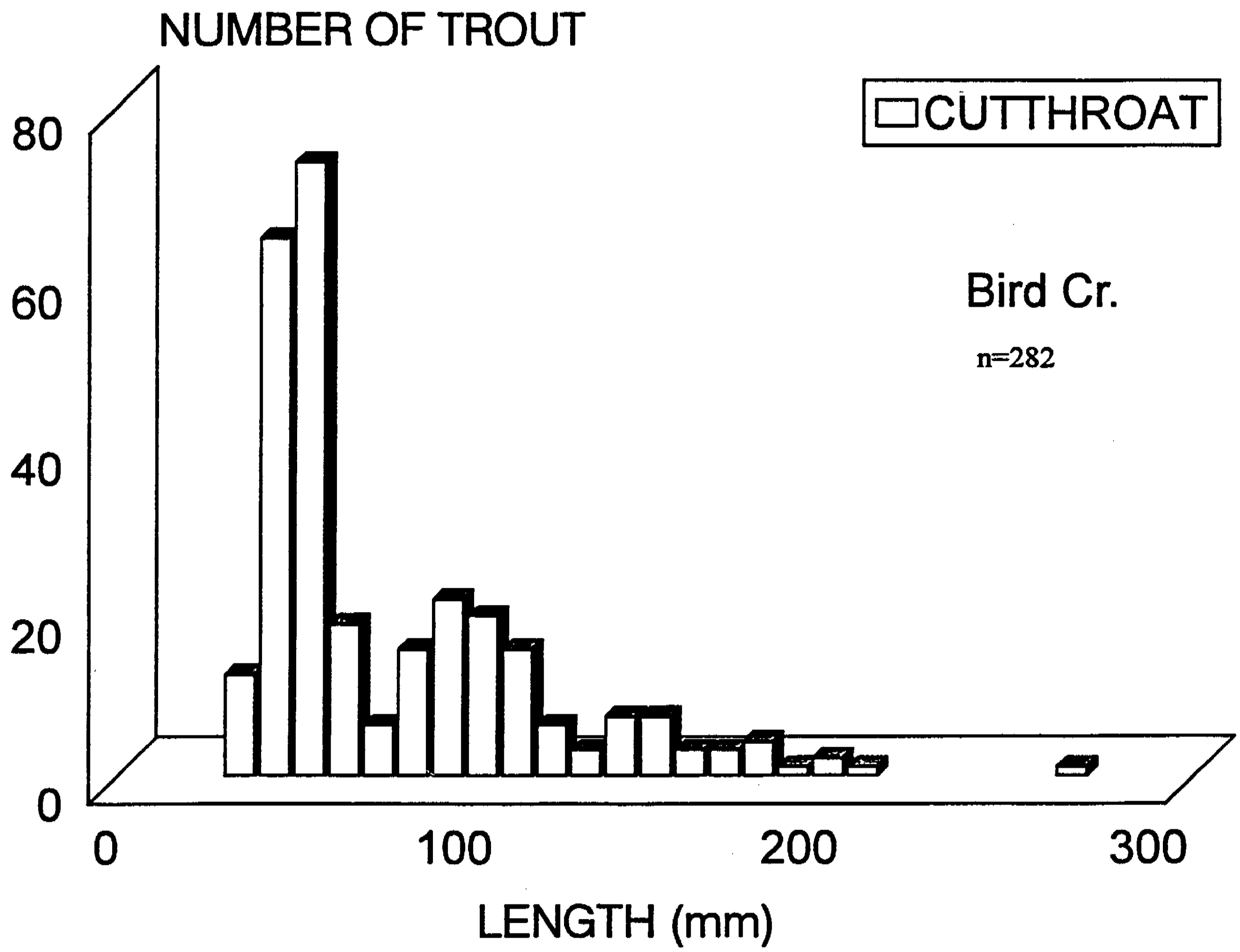

Figure 13. Length frequency of westslope cutthroat trout collected by electrofishing Bird Creek, tributary to the St. Joe River, Idaho, 1996.

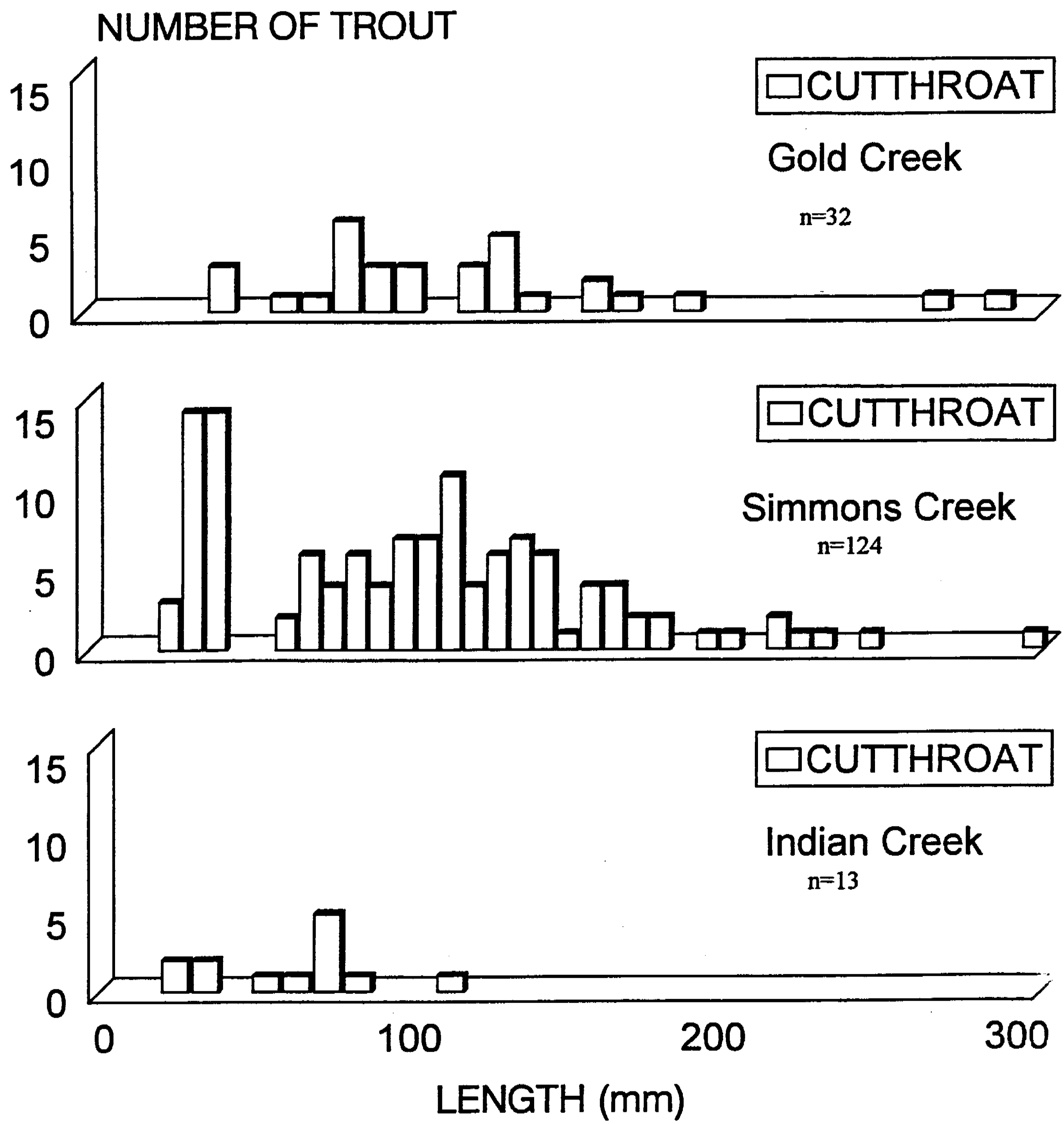

Figure 14. Length frequencies of trout sampled by electrofishing Gold, Simmons, and Indian creeks, tributaries to the St. Joe River, Idaho, 1996.

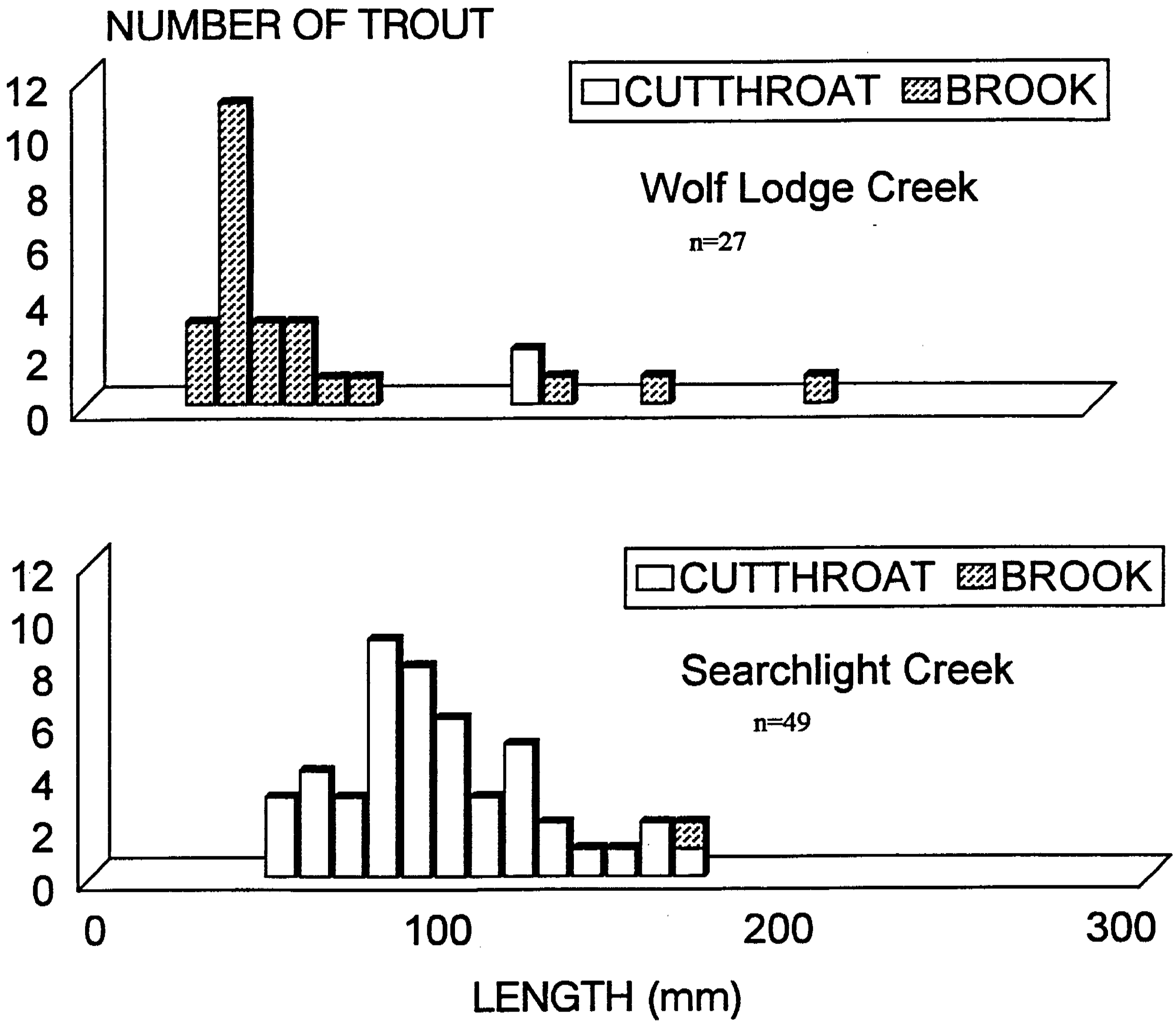

Figure 15. Length frequencies of trout sampled by electrofishing Wolf Lodge and Searchlight creeks, Coeur d'Alene Lake, Idaho, 1996.

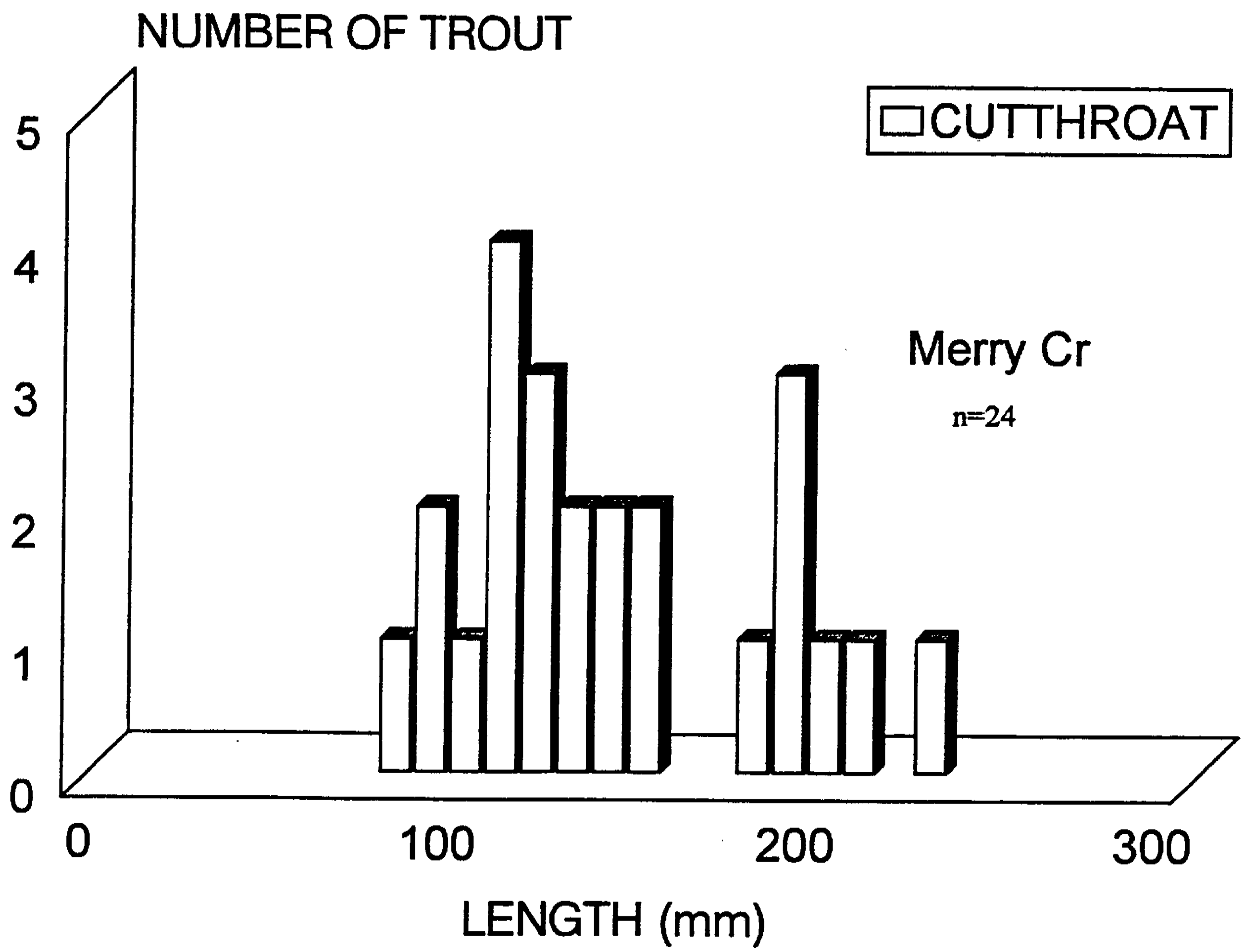

Figure 16. Length frequency of westslope cutthroat trout collected by electrofishing Merry Creek, tributary to the St. Maries River, Idaho, 1996.

Table 4. Number of bull trout redds counted per stream in the Lake Pend Oreille drainage, Idaho, 1983-1996.

	Total redds counted													
Area Stream	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
CLARK FORK RIVER	--	--	--	--	--	--	--	--	--	2	8	17	18[f]	3
Lightning Cr.	28	9	46	14	4	--	--	--	--	11	2	5	0[de]	6
East Fork	110	24	132	8	59	79	100	29	--[a]	32	27	28	3[de]	49
Savage Cr.	36	12	29	--	0	--	--	--	--	1	6	6	0[d]	0
Char Cr.	18	9	11	0	2	--	--	--	--	9	37	13	2[de]	14
Porcupine Cr.	37	52	32	1	9	--	--	--	--	4	6	1	2[d]	0
Wellington Cr.	21	18	15	7	2	--	--	--	--	9	4	9	1[de]	5
Rattle Cr.	51	32	21	10	35	--	--	--	--	10	8	0	1[d]	10
Johnson Cr.	13	33	23	36	10	4	17	33[b]	25	16	23	3	4[d]	5
Twin Cr.	7	25	5	28	0	--	--	--	--	3	4	0	5[d]	16
NORTH SHORE														
Trestle Cr.	298	272	298	147	230	236	217	274	220	134	304	276	140[d]	243
Pack River	34	37	49	25	14	--	--	--	--	65	21	22	0[de]	6
Grouse Cr.	2	108	55	13	56	24	50	48	33	17	23	18	0[d]	50
EAST SHORE														
Granite Cr.	3	81	37	37	30	--	--	--	--	0	7	11	9[d]	47
Sulivan Springs	9	8	14	--	6	--	--	--	--	0	24	31	9	15
North Gold Cr.	16	37	52	8	36	24	37	35	41	41	32	27	31	39
Gold Cr.	131	124	11	78	62	111	122	84	104	93	120	164	95	100
Total 6 index streams	570	598	671	290	453	478	543	503	423[c]	333	529	516	273	486

Table 4 Continued.

Total all streams	814	881	930	412	555	--	--	--	--	447	656	631	320	608

1983 and 1984 data reported by Pratt (1985).
1985 and 1986 data reported by Hoelscher and Bjornn (1989).
[a]Not surveyed in 1991 due to early snow fall.
[b]Upper section not surveyed, count is from Chute Creek downsteam.
[c]Represents only a partial count due to early snow fall.
[d]Observation conditions impaired by high runoff.
[e]Stream counted twice, highest redd count reported.
[f]Two counts made same date, one by walking shoreline (7 redds observed) and one by snorkeling (18 redds observed).
Two redds counted in Strong Creek.

Priest Lake Drainage

A total of 41 bull trout redds were counted in the 11 surveyed tributaries to Upper Priest Lake drainage (Table 5). Using the 3.2 fish/redd expansion factor, a minimum estimate of 131 bull trout may have entered the Upper Priest River drainage to spawn. Waiting until the first week of October to conduct the Upper Priest Lake drainage survey instead of the last week of September may result in a more precise trend in bull trout redd abundance.

St. Joe River Drainage

In the upper St. Joe River drainage 41 bull trout redds were observed in 1996 (Table 6). Expanding the number of redds observed by 3.2 fish/redd, an estimated 131 bull trout spawned in the surveyed reaches of the upper St. Joe River drainage in 1996.

Five streams had comparison counts. In two cases, volunteers counted less bull trout redds than department personnel, 3 vs 14 in SJR from Heller Creek upstream to St. Joe Lake and 0 vs 1 in Wisdom Creek (Table 6). In the other two streams, department personnel counted less redds than volunteers, 23 vs 25 in Medicine Creek and 1 vs 3 in California Creek (Table 6). Bonneau and LaBar (1997) conducted a study to evaluate variability in redd counts by volunteer observers in the LPO drainage. Findings indicated level of observer training and experience may influence the accuracy of the number of bull trout redds identified.

Little North Fork Clearwater River

Ten bull trout redds were identified. Appendix J contains the full report.

Fishery Evaluation

Angler Opinion Survey

Anglers returned a total of 365 questionnaires; 224 from the St. Joe River, 116 from the CDAR-NFCDAR, 12 each from the LNFCDAR and NFSJR, and 1 from the SMR. Analysis and discussion does not include the LNFCDAR, NFSJR, and SMR because of the low number of returned questionnaires.

Anglers from the SJR and CDAR-NFCDAR returned 48% (224 of 466) and 39% (116 of 299), respectively, of the questionnaires originally mailed. The return rate was lower than expected and could have been increased by mailing out two additional postcard reminders as recommended by Dillman (1978). In general, anglers were satisfied with current fishery management programs for both rivers. Angler responses are summarized by river and river section in Appendices A, B, C, and D.

Table 5. Description of bull trout survey locations and transects locations, distance surveyed, and number of redds observed in the Priest Lake drainage, Idaho, 1992-1996.

Stream	Transect discription	Distance (km)	Number of redds observed				
			1992	1993	1994	1995	1996
Upper Priest R.	Mouth of Rock Cr. Upstream to unnamed tributary	3.9	–	–	–	–	15
	Mouth of Rock Cr. Downstream to F.S. trail 317 crossing	0.3	–	2	1	1	2
	Mouth of Lime Cr. Downstream to mouth of Snow Cr.	3.2	–	3	4	2	8
	Togo Gulch to the mouth	0.8	–	0	0	–	0
Rock Cr.	Mouth upstream to F.S. trail 308 crossing	0.5	0	0	–	–	2
Lime Cr.	Mouth upstream approximately 0.8 km	0.8	0	0	–	–	0
Cedar Cr.	Mouth upstream approximately 1.6 km	1.6	–	0	2	1	0
Ruby Cr.	Mouth upstream to barrier waterfall upstream from F.S. Road 655	2.0	0	0	–	–	–
Hughes Cr.	North end of Hughes Meadow upstream to F.S. trail 312 crossing	2.0	7	3	2	0	1
	Foot bridge on F.S. trail 311 downstream to F.S. road 622 bridge	2.4	2	0	7	1	2
	F.S. road 622 downstream to mouth	8.0	–	1	–	–	2
Bench Cr.	Mouth upstrean approximately 0.8 km	0.8	0	2	2	0	1
Jackson Cr.	Mouth upstream to F.Strail 311 crossing	1.6	4	0	0	0	0
Gold Cr.	Mouth upstream approximately 2.0 km	2.0	5	2	6	5	3
Boulder Cr.	Mouth upstream to barrier waterfall	1.6	0	0	0	–	0
Trapper Cr.	Mouth upstream to approximately 0.8 km upstream from East Fork	3.2	–	4	4	2	5
Caribou Cr.	Mouth upstream to old road crossing	1.6	–	1	0	0	0
		Totals	18	18	28	12	41

Table 6. Number of bull trout redds counted in tributaries in the upper St. Joe River drainage, Idaho, 1992-1996. Number in parentheses indicates number of bull trout redds counted by IDFG personnel.

Stream	Number of redds[a] observed 1992[b]	1993[c]	1994[d]	1995[e]	1996
St. Joe River from Spruce Tree Campground to Bean Cr.	–	–	–	4	0
St. Joe River from Bean Cr. To Heller Cr.	0	0	–	–	–
St. Joe River from Heller Cr. To St. Joe Lake[f]	10	14	3	–(20)	3(14)[g]
Bacon Cr.	0	0	–	0	–
Bean Cr.	14	0	–	0	–
Beaver Cr. and Bad Bear Cr.	2	2	0	0	0(0)
Broken Leg Cr.	–	–	–	0	–
California Cr.[f]	2	4	–	2(1)	3(1)
Fly Cr.	–	–	–	0	0
Gold Cr.	–	2	–	0	1
Heller Cr.	0	0	–	0	–
Indian Cr.	–	0	0	–	–
Medicine Cr.[f]	11	33	48	26(17)	25(23)
Mosquito Cr.	–	–	–	0	4
Red Ives Cr.	–	0	–	1	0
Ruby Cr.	0	1	–	8	–
Sherlock Cr.	0	3	–	2	1
Simmons Cr.	–	7	5	0	–
Simmons Cr (3 Lakes Cr to Washout Cr)[f]	–	–	–	5(0)	1
Washout Cr.	–	3	0	0	0
Wampus Cr.	–	0	0	–	–
North Fork Simmons Cr.[f]	–	0	1	–(0)	–
Timber Cr.	–	0	1	0	–
Wisdom Cr.	1	1	4	5	0(1)
Copper Cr.	–	–	–	–	0
Tento Cr.	–	–	–	–	0
Three Lakes Cr.	–	–	–	–	0
St. Joe R. Below Tento Cr. 1.6 km	–	–	–	–	3
Yankee Bar Cr.	1	0	–	–	–

Table 6. Continued.

Totals	57	71	61	73	41

[a] Only definite bull trout redd sightings are reported in this table. Bright/clean gravel areas reported as "possible" bull trout redds are not included.

[b] 1992 survey date was September 25.

[c] 1993 survey date was October 3.

[d] 1994 survey date was September 24.

[e] 1995 survey date was September 30.

[f] Bull trout index streams established in 1995.

[g] Three redds in section above Medicine Creek were reported as resident bull trout (4 small bull trout on small redds).

Creel Survey

North Fork Coeur d'Alene River-The estimated fishing effort was 32,994 h between the Memorial Day opener and September 10, the last day cutthroat can be harvested (Table 7). Anglers caught an estimated 18,286 fish for a catch rate of 0.25 fish/h. Anglers harvested an estimated 372 cutthroat trout over 350 mm and 854 hatchery rainbow (Table 7). Catch rates in the catch-and-release and harvest segments of the river were 0.77 and 0.65 fish/h, respectively (Table 8).

St. Joe River-The estimated fishing effort was 28,714 h between the Memorial Day opener and September 10 the last day cutthroat can be harvested (Table 7). Anglers caught an estimated 25,621 fish for a catch rate of 0.89 fish/h. Anglers harvested an estimated 459 cutthroat trout over 350 mm and 377 hatchery rainbow trout (Table 7). Catch rates in the catch-and-release and harvest segments of the river were 1.4 and 0.6 fish/h, respectively (Table 8).

Exploitation of Tagged Fish

Westslope Cutthroat Trout

St. Joe River-In the SJR, 43 trout 350 mm or longer trout were tagged, 39 westslope cutthroat trout (WCT), 3 bull trout and 1 rainbow trout. Fourteen tags were returned, 13 fish were harvested for an exploitation rate for WCT of 33%. This was probably a minimum exploitation rate.

Coeur d'Alene and North Fork Coeur d'Alene rivers-Very few trout were collected from the CDAR-NFCDAR and only 9 trout 350 mm TL or longer were tagged with a floy tag. Three tags were returned for a minimum exploitation rate of 33%.

Hatchery Trout Evaluation

Return rates for tagged fish ranged from 38% for the 305 mm group stocked into the SJR, to 22% for the 250 mm group stocked into the NFCDAR (Table 9). Stocking tagged and marked rainbow trout into popular fishing areas with the easy access during the time of year when fishing effort was highest was done to determine what maximum return rates may be (Table 10). The intensive creel survey estimated return rates for fin clipped rainbow trout of 0.01% and 21 % for the first 10 days in the North Fork Coeur d'Alene and St. Joe rivers, respectively. The low return rate from the NFCDAR may have been due to scheduling and sampling. Very few anglers harvesting hatchery rainbow trout were interviewed during the 10-day survey.

Table 7. Comparision of creel survey results from the North Fork Coeur d'Alene and St. Joe rivers, Idaho, 1990, 1992 and 1996.

	North Fork Coeur d'Alene River		St. Joe River	
Year surveyed	1992	1996	1990[a]	1996
Survey period	5-23 to 9-11	5-25 to 9-10	5-26 to 9-9	5-25 to 9-10
Survey area	Enaville, ID to Teepee Creek	Cataldo, ID to Teepee Creek	Calder, ID to Sprucetree campground	Calder, ID to Sprucetree campground
Estimated fishing effort	17, 147 ± 1,797	32,994 ± 5,410	19,600 ± 1,761	28,714 ± 5,519
Estimated fish harvested	2,507 ± 854	2,778 ± 1,581	3,418 ± 866	844 ± 951
Estimated fish released	9,885 ± 3,007	15,510 ± 3,583	50,491 ± 6,385	24,740 ± 8,511
Estimated fish caught	12,462 ± 3,147	18,286 ± 5,893	53,914 ± 8,469	25,621 ± 11,398
Estimated catch rate (fish/hour)	0.73	0.55	2.75	0.89
Estimated cutthroat trout harvested	26 ± 36	372 ± 253	705 ± 324	459 ± 827
Estimated rainbow trout harvested	1,926 ± 778	854 ± 584	2,320 ± 672	377 ± 425

[a] Personal communication Joel Hunt, graduate student at University of Idaho, Moscow, ID, 1990.

Table 8. Comparison of catch rates, fish/h, calculated from creel survey data, between the catch-and-release and harvest segments of the North Fork Coeur d'Alene and St. Joe rivers, Idaho, 1990, 1992, and 1996.

	North Fork Coeur d'Alene River		St. Joe River	
Year of survey	Catch & release section	Harvest section	Catch & release section	Harvest section
1990	--	--	3.9	1.6
1992	1.25	0.54	--	--
1996	0.77	0.65	1.4	0.6

Table 9. Number of rainbow trout stocked for length vs return evaluation in the North Fork Coeur d'Alene and St. Joe rivers, Idaho, 1996.

Date stocked	Mean length at stocking (mm)	Number stocked	Number of fish tagged	Number of tags returned	Percent tags returned	Date last tag returned
North Fork Coeur d'Alene River						
6-21-96	254	500	100	22	22	9-11-96
6-24-96	305	500	100	25	25	8-10-96
St. Joe River						
7-12-96	254	500	100	29	29	9-6-96
7-12-96	305	500	100	38	38	10-4-96

Table 10. Estimated fishing effort per interval by river section in the North Fork Coeur d'Alene and St. Joe rivers, Idaho, 1996.

River section	1	2	3	4	5[a]	Total
North Fork Coeur d'Alene River						
Survey interval						
1	--	1,148	2,015	2,372	2,040	7,575
2	1,411	1,351	2,211	5,756	2,986	13,715
3	1,065	315	2,250[b]	2,460[b]	2,130	8,220
4	126	126	2,036	353	843	3,484
Total	2,602	2,940	8,512	10,941	7,999	32,994
St. Joe River						
1	0	0	153	0	--	153
2	1,019	1,182	3,972	5,395	--	11,568
3	1,062	1,192[b]	5,040[b]	3,593	--	10,887
4	273	882	3,654	1,297	--	6,106
Total	2,354	3,256	12,819	16,285	--	28,714

[a] Only the North Fork Coeur d'Alene River was divided into five survey sections.
[b] Indicates river section and interval stocked with mark rainbow trout for evaluation.

DISCUSSION

Westslope Cutthroat Trout Densities

Snorkeling

It appears that cutthroat trout abundance in the snorkeling transects is influenced by water temperatures. In 1994, water temperature reached afternoon highs in the mid 20's C°. High temperatures may have forced cutthroat trout to seek cooler water in tributaries which were not surveyed. In 1995 and 1996, water temperatures reached afternoon highs in the mid to upper teens C, allowing trout to remain in the mainstem. Water temperatures likely influenced the mean number of cutthroat trout per transect (Tables 11,12,13). Higher water levels can also make fish more difficult to see while counting snorkeling transects.

The abundance of westslope cutthroat trout in the catch-and-release and harvest sections of the NFCDAR has benefitted from implementation of more restrictive harvest regulations in 1985 (Figure 17). Current regulations require catch-and-release upstream from Yellow Dog Creek. Downstream from Yellow Dog Creek, the harvest limit for cutthroat trout is one, with a minimum length of 350 mm (Figure 4). Although the mean number of cutthroat per transect increased, the abundance of the cutthroat trout in the NFCDAR did not reach the same population levels as in the St. Joe River (Figure 18). Since 1990, the mean number of cutthroat trout per transect in the St. Joe River was almost twice as high as in the NFCDAR.

A major difference between the two systems is the amount of instream trout cover, such as deep pools and large woody debris more commonly found in the SJR. Bedload has filled in many pools in the NFCDAR, turning them into riffles or glides. In the NFCDAR, two transects in the roadless section between Teepee and Jordan creeks have been relocated because bedload deposition created shallow riffles in place of pools or eliminated the transect all together. Flooding during the winter 1995-96 shifted massive amounts of sediment. Some areas benefitted and others were degraded.

Problems of habitat degradation are not restricted to the NFCDAR. In the SJR system there appears to be a downward trend in the mean number of cutthroat trout observed per transect in the catch-and-release section of the river since 1990 (Figure 18). This may be an indication that recruitment from spawning and rearing tributaries has been affected by habitat degradation. Several tributaries to the St. Joe River, including Bluff, Bird, Eagle, Fishhook and Prospector creeks have developed substantial gravel bars at the mouths. This may be an indication that land management activities are having an effect on the stream stability. Flooding during the winter of 1995-96 caused many unstable streams to transport large amounts of gravel into the St. Joe River. However, at the mouths of stable tributaries, especially those in the section from Heller Creek upstream, gravel deposition appeared less substantial. Additional logging and road building in SJR tributaries will likely result in habitat declines similar to those declines in the NFCDAR.

In addition to habitat degradation in St. Joe River tributaries, the downward trend in mean number of cutthroat trout per transect in the catch-and-release area may be partially attributed to fishing. Changing the management of the St. Joe River fishery from Prospector Creek upstream from harvest to catch-and-release in 1988 increased cutthroat trout abundance. This increase in cutthroat abundance has attracted more anglers. Fishing effort estimates for the whole river have increased from 19,600 h in 1990 (per. comm. Joel Hunt) to 28,700 h in 1996. Increased fishing pressure leads to increased handling of fish in the catch-and-release area.

Table 11. Mean number of westslope cutthroat trout counted in snorkeling transects in the Little North Fork Coeur d'Alene River, Idaho, for 1973, 1980-81, 1988, 1991, and 1993-1996.

	Year								
River section	1973	1980	1981	1988[2]	1991[3]	1993[4]	1994	1995	1996
Mouth to Horse Heaven (7&8)	5.6[1]	5.9[1]	7.5[1]	2.7	3.9	3.8	2.1	0.6	3.6
Mouth to Laverne Creek (7)	--	--	0.8[5]	1.0	3.3	3.3	0.6	0.9	1.5
Laverne to Deception Cr. (8)	--	--	3.8[5,6]	7.4[6]	1.5	0.5	4.0	0	13.5
Deception to Horse Heaven (8)	--	--	--	--	5.3	--	4.7	0.7	2.7

[1]Average value for July, August and September sampling.
[2]July 20 sampling.
[3]August 21-25 sampling.
[4]July 29 sampling.
[5]Average value for 1980-1981.
[6]Densities from transects from Laverne Creek to Iron Creek.

Table 12. Mean number of westslope cutthroat trout counted in snorkeling transects in the North Fork Coeur d'Alene River, Idaho, 1973, 1980-81, 1987-88, 1991, and 1993-1996.

	Year									
River section	1973[1]	1980[1]	1981[1]	1987[2]	1988[3]	1991[4]	1993[5]	1994	1995	1996
Confluence of South Fork Cd'A River to Yellowdog Creek	2.4	0.5	0.9	--	1.4	7.5	22	15	18	10
Yellowdog to Tepee Creek	11.2	6.8	5.7	25.4	27.3	28.4	9	33	31	27
Tepee Creek to Jordan Creek	6.0[6]	5.6[6]	5.7[6]	16.4	3.2	1.5	2.7	11.8	4	16
Tepee Creek mouth to Independence Creek	0	1.6	3.9	2.2	1.2	2.6	3.2	2.0	1	0.4
Confluence of South Fork Cd'A River to Jordan Creek (including Tepee Creek)	4.6	3.2	3.4	--	10	8.6	14	15.5	15	13

[1]Average value for July, August and September sampling
[2]August sampling
[3]July 20-24 sampling
[4]August sampling
[5]July 18 - August 4 sampling
[6]Fish per transect calculated for Tepee Creek to Cow Creek

Table 13. Mean number of westslope cutthroat trout counted in snorkeling transects in the St. Joe River, Idaho, 1969-77, 1979-80, 1982, 1990, and 1993-1996.

	Year											
Stream section	1974	1975	1976	1977	1979	1980	1982	1990	1993	1994	1995	1996
Prospector to Spruce Tree Campground	27.0	28.9	48.8	32.6	29.8	28.3	55.4	52.8	40.3	29.4	46.0	3.8
Spruce to Ruby Creek	59.0	74	22.8	55.8	38.0	17.6	40.0	49.0	14.0	9.8	28.0	21.0
Prospector to Ruby Creek	--	--	--	--	--	--	--	51.7	32.9	23.8	41.0	33.0
Calder to Avery	--	--	--	--	--	--	--	1.6	4.4	12.4	9.0	7.6
Avery to Prospector	4.0	3.4	--	2.0	3.3	4.7	1.1	12.0	21.3	7.7	19.0	7.4
Calder to Prospector Creek	--	--	--	--	--	--	--	5.9	11.4	10.1	14.0	23.0
Calder to Ruby Creek	--	--	--	--	--	--	--	35.0	24.3	18.3	30.0	28.0

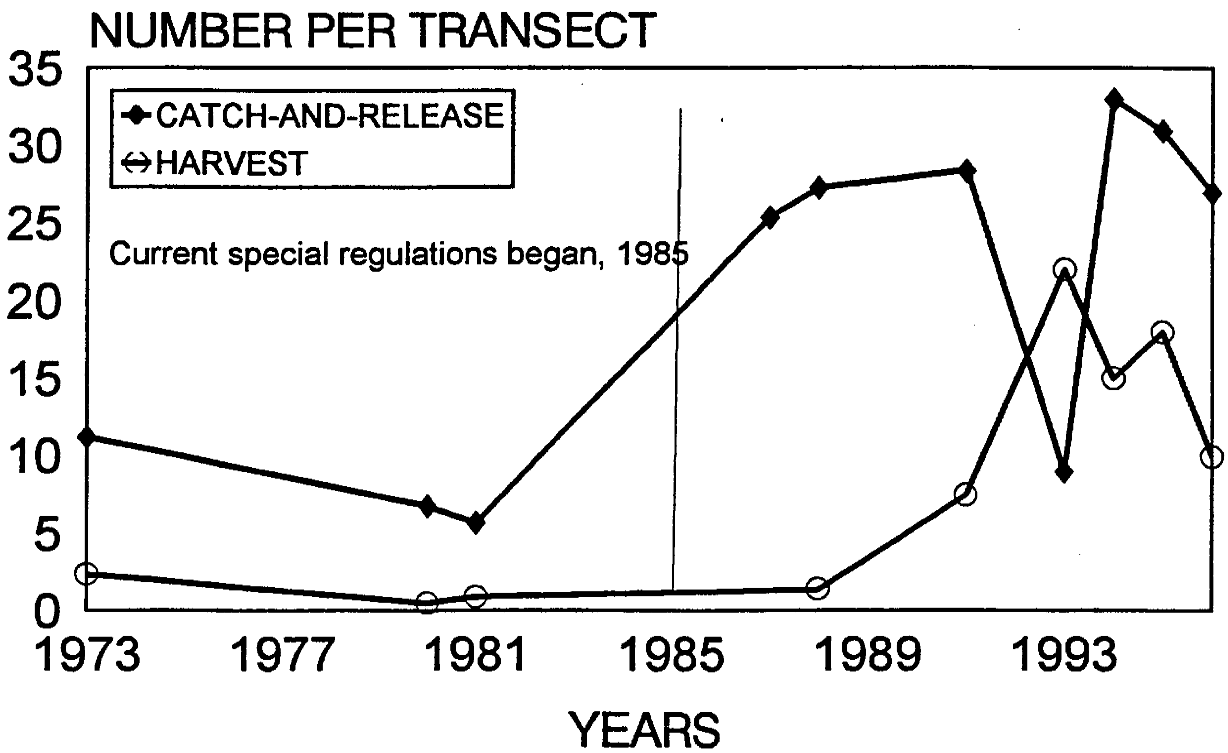

Figure 17. Mean number of westslope cutthroat trout observed per snorkeling transect in the North Fork Coeur d'Alene River catch-and-release section from Yellow Dog Creek upstream to Teepee Creek and in the harvest area from Yellow Dog Creek downstream to the confluence with the South Fork Coeur d'Alene River, Idaho, 1973-1996.

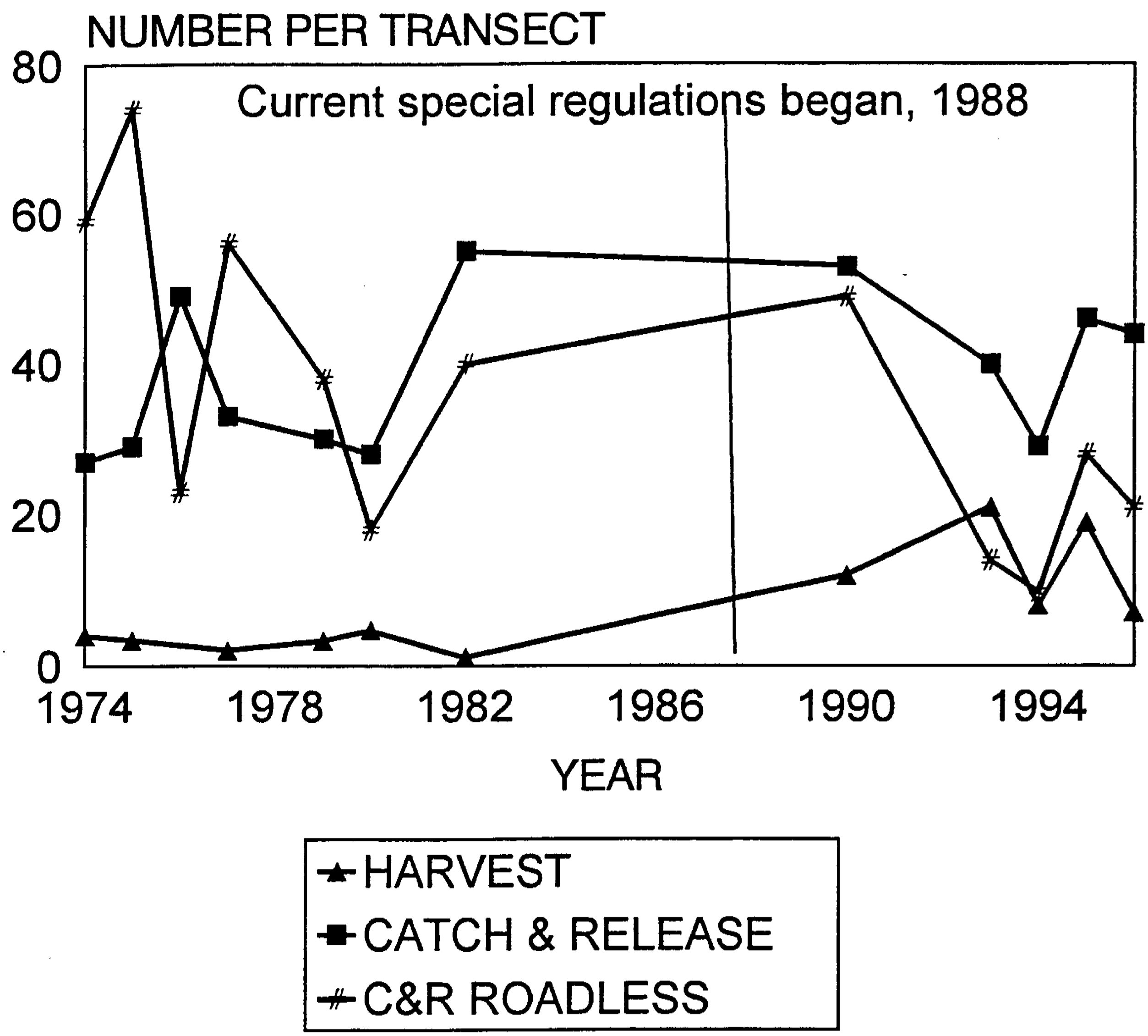

Figure 18. Mean number of westslope cutthroat trout per transect in the harvest area, Avery upstream to Prospector Creek, and in the catch-and-release area from Prospector Creek upstream to Spruce Tree Campground to Ruby Creek, St. Joe River, Idaho, 1974-1996.

Handling stress related mortality may be as high as 5% (Schill 1983, 1991, 1995, Schill et al. 1986 and Wydoski 1977).

More restrictive fishing regulations implemented in 1985 on the LNFCDAR appeared to have provided a slight increase in mean number of cutthroat per transect until 1988 (Figure 19). Since then the number of fish has declined. Habitat degradation has severely limited cutthroat trout recruitment. The system is very unstable and large amounts of bedload are being transported downstream (U.S. Forest Service 1992). Flooding during the winter 1995-96 caused severe damage to unstable tributaries and the main river. For example, so much bedload was deposited at Owl Creek that the river went subsurface for the first time in recent history.

The apparent large increase in mean number of cutthroat trout per transect for the catch-and-release section in 1996 (Figure 19) may not be as large as indicated. The data point used in the graph was based on only two transects because previous data dating back to 1980 included only these two transects. Three additional transects were counted in 1996 and if these transects were included in the mean number of fish per transect (Appendix C), then the mean would have been 7, suggesting a less significant increase. This increase may not be the start of an upward trend based on previous data. It may just reflect groups of fish moving within the system due to environmental factors such as water temperature or physical habitat changes. In 1995, these same transects held no fish (Table 11).

The differences in cutthroat trout densities between the SJR, LNFCDAR and NFCDAR, appeared to be related to habitat quality. Cutthroat trout densities were greater where habitat quality appeared to be adequate, with better habitat generally supporting higher cutthroat trout densities. Where habitat quality appeared poor, cutthroat trout densities were low. The discrepancy between fish populations in the SJR and NFCDAR indicates fishing regulations (i.e. catch-and-release) will not substantially improve cutthroat trout fisheries when trout habitat is poor.

Electrofishing

The mean number of westslope cutthroat trout per kilometer in the SJR catch-and-release area was 20 times higher than in the harvest area. In the catch-and-release area from Copper Creek to Beaver Creek, the population estimate for WCT was 1,920 fish/km in 1995 (Horner et al., 1997), in 1996 the population estimate for Packsaddle Campground downstream to Marble Creek was 97 fish/km. If the catch-and-release area were expanded from Prospector Creek downstream to North Fork St. Joe River, the number of WCT would probably increase to densities similar to the catch-and-release area upstream from Prospector Creek. That would be a ten-fold increase in westslope cutthroat trout abundance. Catch rates would increase but harvest rates would decline because put-and-take rainbow stocking would be eliminated in this section of the SJR. Angler opinions concerning this option will be discussed later in this report.

There appeared to be more rainbow trout and rainbow x cutthroat hybrids in the harvest sections of the SJR and CDAR-NFCDAR than in the catch-and-release sections of the rivers (Figure 7). Rainbow trout are not native to the drainage and are present as a result of our stocking program. Hybridization may be detrimental to westslope cutthroat trout due to contamination of the gene pool. It is not clear if this will affect long term persistence of westslope cutthroat trout. Prevention of hybridization is one reason to put hatchery rainbow trout into catch out ponds instead of the river. Bull trout were found in both the harvest and catch-and-release sections of the St. Joe River.

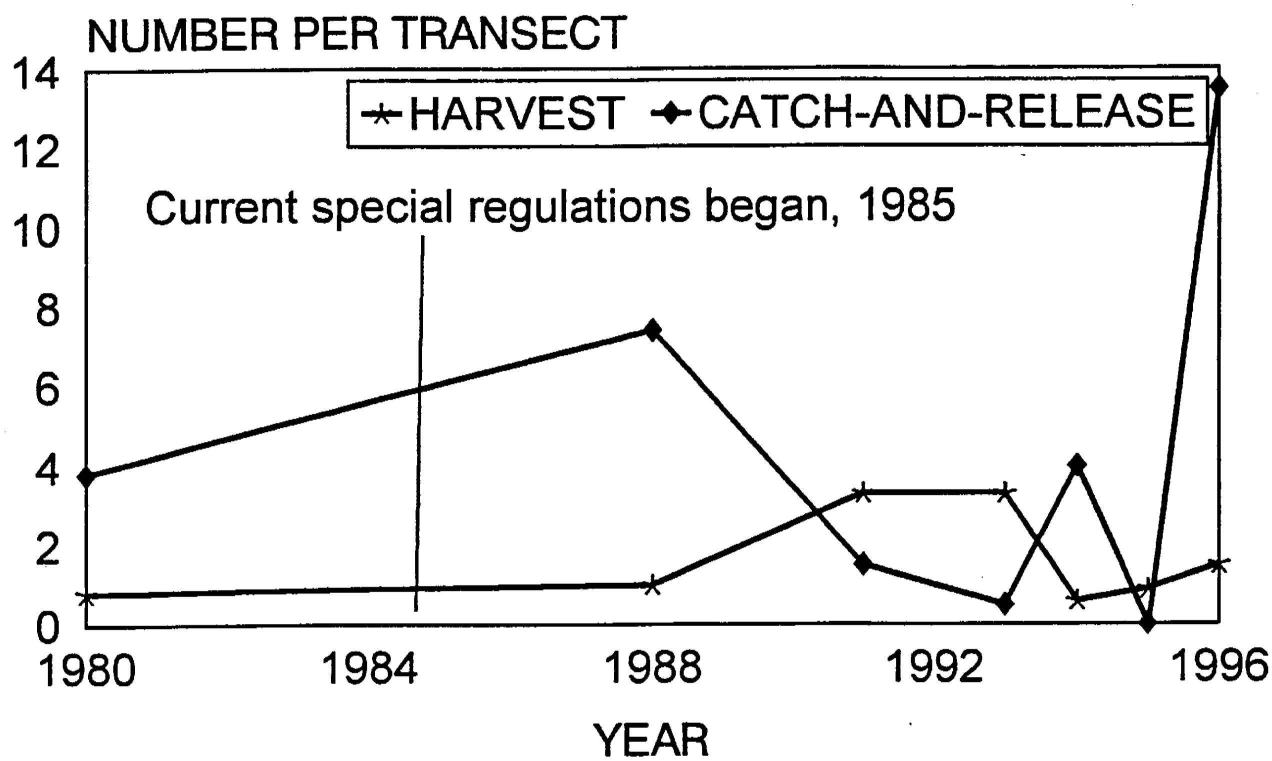

Figure 19. Mean number of westslope cutthroat trout per transect in the Little North Fork Coeur d'Alene River catch-and-release area, Laverne Creek to Deception Creek and in the harvest area from Laverne Creek downstream to the confluence with the North Fork Coeur d'Alene River, Idaho, 1980-1996.

Tributary Evaluation

Very few bull trout YOY were found in the surveyed LPO tributaries in 1996. The lack of YOY in the summer of 1996 may be attributed to the 1995-96 winter flooding that occurred. In 1994, the Division of Environmental Quality surveyed many of these same streams in the Lightning Creek drainage that were surveyed in 1996. More bull trout YOY were collected in 1994 than in 1996, 87 and 2, respectively (pers. comm. Jack Skille, DEQ biologist) (Figure 8). A major difference between these two years was the amount and timing of water discharge.

In 1994, the highest mean-daily-flow, 67.6 m^3/sec, occurred on 3 April and the highest mean-monthly-flow, 58.6 m^3/sec, occurred in May. In November and December 1995 and February 1996, the highest mean-daily-flows were 124 m^3/sec, 113 m^3/sec, and 147 m^3/sec, respectively. These flows were almost twice as high as the flows in April 1994. Bull trout usually hatch in mid March to mid April and emerge two to three weeks later depending on water temperature (McPhail and Murry 1979, Weaver and White 1985). Bull trout eggs and alevins may be vulnerable to disturbances until they emerge from the gravel. The flooding in the winter of 1995-1996 moved large amounts of bedload. This disturbance may have severely affected bull trout egg survival resulting in the lack of bull trout YOY in the summer of 1996. The lack of YOY in 1996 may eventually result in fewer bull trout redds five to six years later.

Length frequencies of westslope cutthroat trout collected from SJR tributaries in July indicated fish over 250 mm TL were rare (Figures 12,13,14). Typical westslope cutthroat spawning behavior have adfluvial and fluvial fish migrating out of the spawning tributaries prior to July 1. The current July 1 opening date for fish harvest in tributaries was implemented to protect spawning cutthroat. This management appears to be adequate protection for adfluvial and fluvial spawning westslope cutthroat trout because of the lack of mature cutthroat. The lack of cutthroat over 250 mm TL may also be a result of harvest however, the level of fishing effort and harvest is unknown in these tributaries.

Bull Trout Spawning Survey

Spawning escapements for bull trout throughout northern Idaho in 1996 were low in comparison to other survey years. The result of the bull trout redd surveys suggests a declining bull trout population in the LPO system since 1983. While habitat degradation is believed to be the major factor for the decline of bull trout, harvest of bull trout in the LPO and the lower Clark Fork River prior to 1996 probably resulted in fewer adult bull trout available to spawn. The Idaho Department of Fish and Game closed the last remaining catch and keep bull trout fishery in Idaho, Lake Pend Oreille and the lower Clark Fork River, during the 1996-1997 regulation cycle. The closure may have helped to increase bull trout spawning escapement. The increase in bull trout escapement due to the harvest closure may be more evident in 1997.

Forty-one bull trout redds counted in the Upper Priest Lake drainage was the highest total recorded since surveys began in 1992. The increase was due in part to surveying a new section of the Upper Priest River, from the mouth of Rock Creek upstream 3.9 km. Fifteen redds were observed in this section. Some of the increase in redds counted may be attributed to completing the drainage survey a week later than in past years. A complete inventory of the entire Upper Priest River for two to three years would help us select an area to count bull trout redds that would provide better trend information on bull trout population abundance.

The bull trout population in the St. Joe River system is the only one remaining in the Spokane River drainage. However, population numbers are very low when compared to the Lake Pend Oreille drainage bull trout population. Spawning activity is primarily confined to the upper reaches of the SJR basin, which is virtually unlogged with low road densities. On the other hand, spawning escapement into the Little North Fork Clearwater River is unknown. Continuing research is needed to determine the bull trout abundance in this area.

Fishery Evaluation

Angler Opinion Survey

Several angler responses to some of the questions were similar in the SJR and CDAR-NFCDAR. The mean number of years fished on both rivers was 10 (Appendix C, D). A majority of the anglers fished with flies, however more anglers used bait on the CDAR-NFCDAR (24%) than on the SJR (10%) (Appendix C, D). The majority of anglers felt the fishing regulations were easy to follow. The majority of anglers felt it was important to allow catch-and-release as well as harvest opportunities in each river. Only 48% of the anglers wanted to expand the catch-and-release area in the NFCDAR and 68% of the anglers on the SJR supported expansion of the catch-and-release area. The seemingly overwhelming majority of 68% was not as overwhelming when separated by river sections. Less than 50% of the anglers who fished the SJR harvest areas supported expanding the catch-and-release section of the river. Whereas, over 95% of the anglers who fished the SJR catch-and-release section supported expanding the catch-and-release area. Careful consideration must be taken before expanding the catch-and-release area on the SJR.

The responses to questions concerning the harvest areas were different for each river. If harvest opportunities were eliminated, only 17% of the SJR anglers would decrease or stop fishing the harvest area whereas 38% of the CDAR-NFCDAR anglers would decrease or stop fishing the harvest area. In the CDAR-NFCDAR, 35% of the anglers would decrease or stop their fishing activity if use of bait was prohibited; in the SJR, only 18% of the anglers would decrease or stop their fishing activity. If hatchery stocking were eliminated, 26% of the CDAR-NFCDAR anglers and 16% of the SJR anglers would decrease or stop fishing these areas. Neither group of anglers supported the idea of removing hatchery fish from the river and putting them into catch out ponds adjacent to the river. Fifty percent of both groups of anglers felt guided walk and wade fishing trips were not appropriate on either river.

Not only were the responses to questions concerning the harvest areas different for each river, the responses were different for different sections within the river. In the SJR, 68% of the anglers supported expanding the catch-and-release area. However, in Section 3, the section most affected by expansion, only 46% of the anglers supported the idea and 40% did not (Appendix B). The support was not as high as the total responses indicated. Responses to questions concerning the harvest area, Prospector Creek downstream to Fall Creek, indicated 14% of the anglers would decrease or stop fishing this area if trout harvest was prohibited. If use of bait was prohibited in this area, 18% of the anglers would decrease or stop fishing. If stocking were discontinued in this area, 15% of the anglers would decrease or stop fishing (Appendix B).

In the CDAR-NFCDAR, 33% of the anglers would decrease or stop fishing in the section from Yellow Dog Creek downstream to Lost Creek if harvest opportunity were eliminated (Appendix A). If use of bait was prohibited, 21% of the anglers would decrease or stop fishing this area (Appendix A). If stocking was discontinued, 25% of the anglers would decrease or stop fishing this area.

Analysis of the survey results is not complete. Recommendations for changes, if any, will be made after analysis is completed. This survey was designed to determine the attitudes of anglers, especially the potentially displaced angler, to changes in fishing opportunities. Fishery managers must consider the effect regulation changes can have on anglers and weigh the desires of different groups of anglers with the biological needs of the fishery.

Creel Survey

Estimated fishing effort in 1996 higher in the NFCDAR than in the SJR in 1996 (Table 7). Estimated fishing effort in both rivers have increased since the previous surveys in the NFCDAR (Davis et al. 1996) and SJR (pers. comm. Joel Hunt, graduate student at University of Idaho) (Table 7). Increased fishing effort resulted in higher estimates in the NFCDAR for total fish caught, released and kept, and harvest of individual species than in 1992 (Table 7). In the SJR, estimates for total fish caught, released, and kept as well as estimated harvest for individual species, were lower in 1996 than in 1990, even though estimated fishing effort was 47% higher in 1996 than in 1990 (Table 7).

Catch rates in the SJR may be closely related to population abundance. In the catch-and-release segment of the SJR, the catch rate was 1.4 fish/h. Cutthroat trout abundance was estimated to be 1920 fish/km in 1995 (Horner et al. 1997) and the mean number of cutthroat trout per transect in the roaded catch-and-release segment for 1996 was 44 (Table 13). In contrast, the catch rate for fish in the harvest segment of the SJR was 0.6 fish/h (Table 8). The estimated number of cutthroat trout in the harvest segment was 97 fish/km and the mean number of cutthroat trout per transect was 23 (Table 13). The lower catch rate in the harvest segment appears to related to lower cutthroat trout abundance.

Catch rate in the catch-and-release segment of the NFCDAR was 0.77 fish/h (Table 8). The population estimate for the catch-and-release segment was 109 fish/km in 1993 (Nelson et al. 1996) and the mean number of cutthroat trout per transect was 27 (Table 12). In contrast, the catch rate in the harvest segment of the NFCDAR was 0.65 fish/h (Table 8). The mean number of cutthroat trout per transect was 10 (Table 12). No population estimates were completed in 1993 and 1996 due to the low number of recaptures in both attempts.

Catch rates in the harvest segments in the SJR and NFCDAR were lower than the catch rates in the respective catch-and-release segments. However, the catch rate in the catch-and-release section of the SJR was higher than in the catch-and-release section of the NFCDAR and the same was true for the harvest sections. Catch rates indicated cutthroat trout abundance was higher in the SJR than in the NFCDAR. Electrofishing data also indicated more cutthroat trout were collected in the catch-and-release and harvest sections of the SJR than in the NFCDAR (Figure 20). Catch rates appear to reflect trout abundance and may be used as an indicator of relative trout abundance.

One of the objectives of the creel survey was to compare sampling intensity used in 1996 with the sampling intensity used in the 1992 and 1990 surveys and corresponding results. The creel surveys used in 1990 and 1992 were intensive surveys that required many man-days and high operating costs. In these surveys, 50% of the weekend days including holidays were surveyed along with 20% of the weekdays. If a survey started on 25 May, Memorial weekend, and ended on 10 September, the total number of weekend days and weekdays would equal 109 days (35 weekend days and holidays, 74 weekdays). Using the above percentages the total number of survey days would be 33 days (18 weekend days and holidays and 15 weekdays). This is 42% of the time available for a 3-month temporary bioaide position. This time does not count days needed

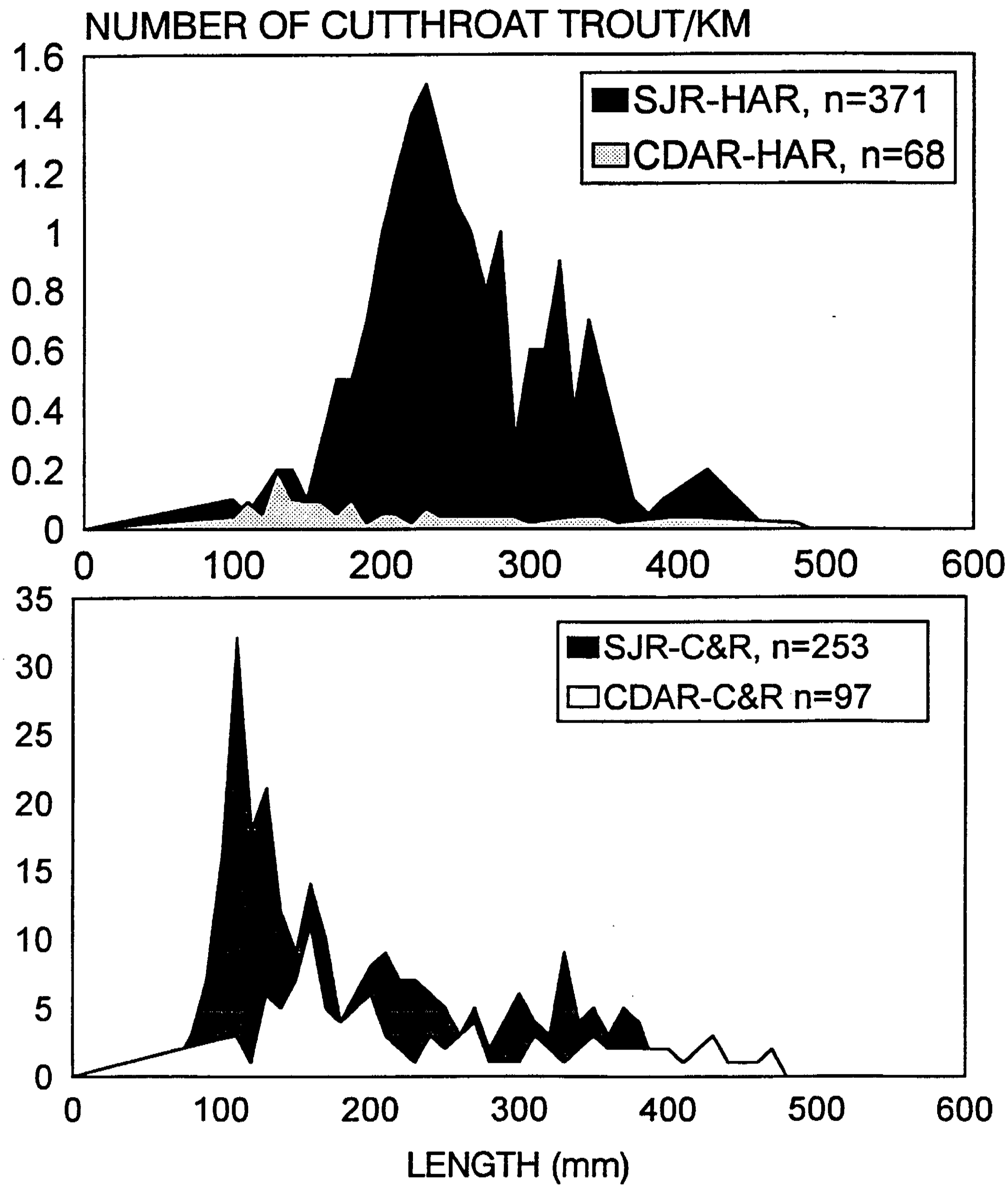

Figure 20. Number of westslope cutthroat trout per kilometer collected by electrofishing in similar sections of the North Fork Coeur d'Alene and St. Joe rivers, Idaho. Data for the harvest sections were collected in 1996. Data for the catch-and-release sections were collected in 1993 in the NFCDAR and 1995 in the SJR.

for creel data entry and any other time needed for scale preparation and reading etc. A creel survey of this design is probably a full time project with little time available for other projects.

The creel survey design used in 1996 was less intensive than the one described above. There were only 15 survey days, 10 weekend days and holidays and five weekdays, for a 45% reduction in field time. This 'extra' time would be available for other important projects. There may be a decrease in operating costs depending on how the extra time was used.

Both survey designs provide data to calculate point estimates for fishing effort and harvest. The difference is in the confidence intervals. Generally, the more intensive surveys have smaller confidence intervals, in 1990 and 1992 most of the C.I. were less than 40%. The less intensive 1996 surveys had confidence intervals over 40%, (Table 7). Several factors influence C.I. including: variability of fishing effort on a daily or hourly basis. If fishery managers are willing to except a larger confidence interval then a low intensity creel survey is satisfactorily.

Choosing a creel survey design depends on the objectives. If the main objective is to determine the general trend in fishing, then a low intensity creel survey is sufficient. If the objectives require a more accurate estimate, then a more intensive survey is appropriate. Several other factors help determine the design, including cost, priority, time, and man-power. In many cases, a low intensity creel survey design is satisfactory. Additional creel data is in Appendix L.

Exploitation

Westslope Cutthroat Trout-Nichols et al. (1991) suggested that tags returns for $5.00 reward tags were 50% of actual harvest resulting in an exploitation rate of WCT in the SJR that may be as high as 66%. Nichols et al. (1991) did not evaluate the addition of a $100.00 gift certificate incentive so that the actual exploitation rate was probably between 33% and 66%. If this exploitation rate, 33% - 66%, and the estimated number of WCT 350 mm or longer harvested, calculated through the creel survey, of 495, were combined, then the estimated number of WCT 350 mm or longer in the St. Joe River from Packsaddle campground downstream to Fall Creek ranged 750 as the low estimate to 1,500 as the high estimate. It appears that westslope cutthroat trout over the minimum harvestable length, 350 mm, were harvested at a high rate in the St. Joe River and the Coeur d'Alene and North Fork Coeur d'Alene rivers. The number of cutthroat trout observed by snorkeling indicates that fish over 300 mm are less abundant in the harvest sections of the SJR, NFCDAR, and LNFCDAR than in the catch-and-release sections of the rivers further indicating the vulnerability of cutthroat trout to harvest (Figure 5). Liberalization of the harvest regulations in these areas would probably increase the harvest likely resulting in the overall decline of the westslope cutthroat trout population. More restrictive regulations would likely improve catch rates and size structure in the St. Joe River cutthroat trout fishery. Some benefits might also accrue in the NFCDAR, but these would likely be limited by habitat constraints.

Hatchery-Return rates from the CDAR-NFCDAR and SJR could be doubled and have ranged between 44% - 76% based on a 50% tag return rate (Nichols et al. 1991). However, harvest estimates from the 1992 NFCDAR creel survey (Davis et al. 1996) and from a 1990 creel survey on the SJR (Joel Hunt, pers. comm.) indicated hatchery rainbow trout harvest rates were 16% and 30%, respectively. This would support an assumption that the tag return rates in 1996 were very close to 100% return for harvested tagged rainbow trout.

The highest number of tags returned occurred in the first few weeks after stocking (Figure 21). The number of tags returned declined throughout the remainder of the season. This may be an indication that hatchery rainbow trout can provide an acceptable fishery for 3-4 weeks before needing to be restocked.

Neither normal sized (250 mmTL) or longer than normal (305 mmTL) sized put-and-take rainbows reached the minimum acceptable return rate of 40% (Idaho Department of Fish and Game 1996). Even though the 305 mm size groups returned at higher rates, it may not be the best size trout to stock. Raising and stocking a 305 mm rainbow trout costs more than a 250 mm rainbow trout, $0.67/fish and $0.42/fish, respectively. In addition, fixed hatchery capacity will limit the number of kilograms of put-and-take rainbow the hatchery system can rear. Rainbow trout 305 mm TL weigh more than 250 mm rainbow trout, 3.2 305 mm fish/kg versus 5.5 250 mm fish/kg. If 305 mm trout were reared, then fewer trout would be available for stocking.

Stocking fewer 305 mm rainbow trout would result in fewer rainbow trout caught by the angler than if 250 mm rainbow trout were stocked, even with the higher return rate for the 305 mm rainbow trout. For example, if we normally stock 10,000 250 mm trout that weigh 1,814 kg, it would be equivalent to stocking 5,805 305 mm trout. If we use the return rates for the 1996 survey on the SJR of 38% for 305 mm fish and 29% for 250 mm fish, then the total number of fish harvested would be less for the 305 mm fish than for the 250 mm fish, 2,206 and 2,900, respectively. Therefore, stocking 305 mm trout in the NFCDAR and SJR, while possibly achieving 40% return rates under the best conditions, may be more expensive.

However, Mauser (1997) reported that two out of three Wood Valley, Idaho anglers preferred to catch one 305 mm fish rather than two 230 mm fish. This question was not asked during the study on the SJR and NFCDAR. If the same preference applies to the anglers who fish the harvest areas of the SJR and NFCDAR occurs then a 305 mm may be the best size rainbow to stock even though fewer fish will be stocked.

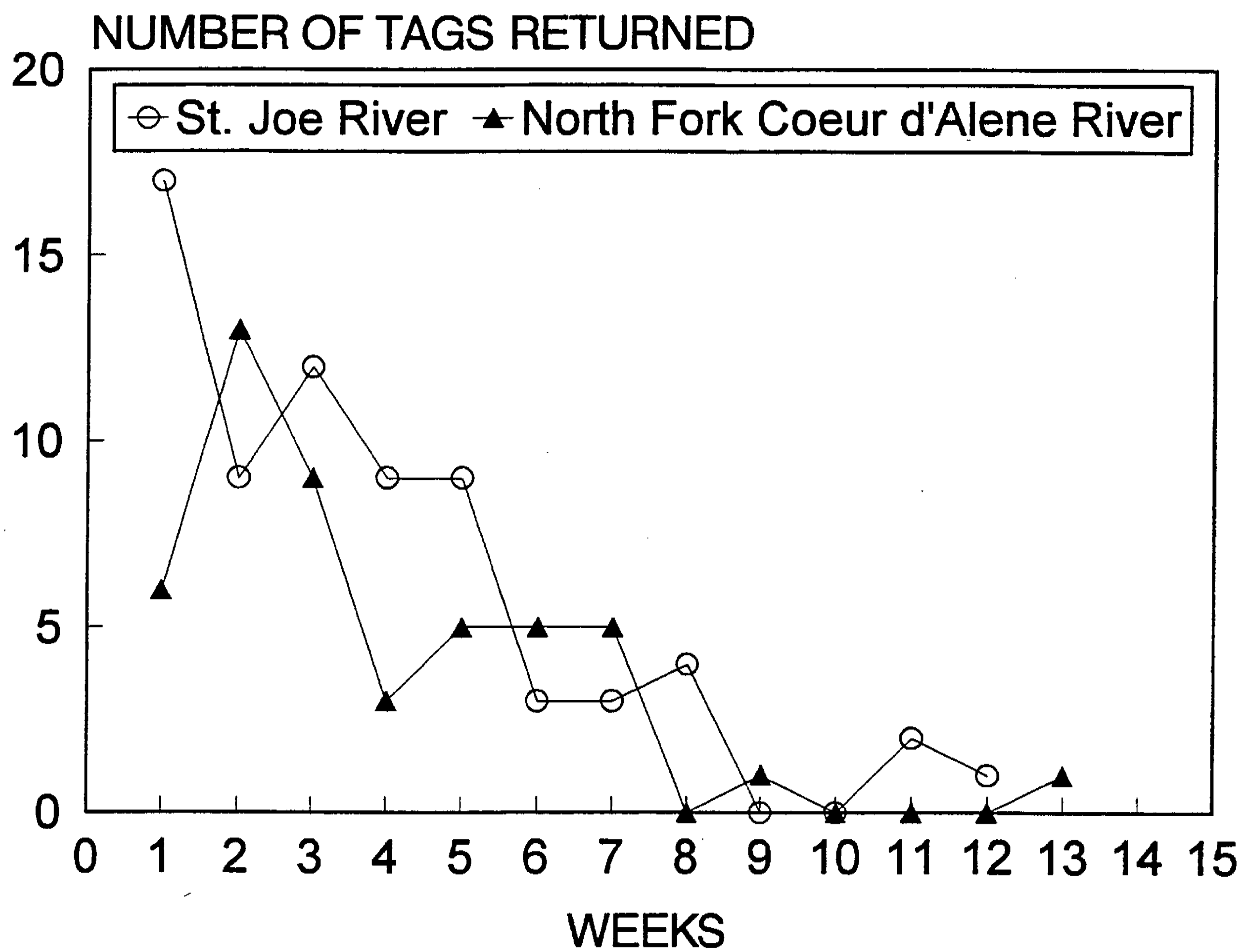

Figure 21. Number of reward tag returns each week following stocking in the St. Joe and North Fork Coeur d'Alene rivers, Idaho, 1996.

RECOMMENDATIONS

1. Conduct biennial snorkeling surveys in the LNFCDAR, NFCDAR, and SJR using snorkeling or electrofishing.

2. Conduct biennial electrofishing population estimates in the LNFCDAR, NFCDAR, and the SJR to correspond with snorkeling surveys.

3. Use biological information from SJR and CDAR-NFCDAR to model population responses to various regulation scenarios.

4. Stock 305 mm hatchery reared trout into the North Fork Coeur d'Alene River or St. Joe River drainages.

5. Survey all seventeen bull trout spawning streams in the Pend Oreille drainage in 1997.

6. Monitor bull trout abundance through redd counts in four index streams in the St Joe River drainage, Medicine Creek, Wisdom Creek, St. Joe River from Heller Creek to Medicine Creek and St. Joe River from Medicine Creek upstream to the cascades below St. Joe Lake, establish a long term trend in abundance.

7. Count bull trout redds in the Upper Priest Lake drainage the first week of October instead in the last week of September.

8. Survey the entire Upper Priest River for three years to establish new bull trout redd counting areas.

9. Continue with increased enforcement efforts in the tributary streams during late summer and early fall when adult bull trout are vulnerable to illegal harvest.

10. Post bull trout identification and regulation signs showing harvest closures.

11. Actively oppose any land use activities that could detrimentally affect bull trout habitat and support activities that protect or recover critical habitats.

12. Continue to assess flood effects on bull trout year class strength.

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APPENDICES

Appendix A. Summary of angler opinion survey for the North Fork Coeur d'Alene River, Idaho, by river section 1996.

SPOKANE RIVER DRAINAGE ANGLER SURVEY

SECTION 1. These questions pertain to the **North Fork Coeur d'Alene River only.**

1. How many years have you fished the North Fork Coeur d'Alene River at least once? _______years

	Section 1	Section 2	Section 3	Section 4	Section 5
N of cases	9	7	25	37	26
Minimum	0	2.0	0	1.0	1.0
Maximum	30.0	30.0	70.0	45.0	30.0
Median	2.0	5.0	4.0	15.0	5.0
Mean	5.8	11.4	8.9	15.5	8.3
Std. error	3.1	4.5	2.8	2.1	1.6

2. How many days in the past 5 years have you fished the North Fork Coeur d'Alene River? (Please check one)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ 1-5	1	1.0	2	1.9	7	6.7	6	5.8	8	7.7
___ 6-10	2	1.9	0	0	3	2.9	6	5.8	4	3.9
___ 11-15	2	1.9	1	1.0	3	2.9	4	3.9	3	2.9
___ 16-20	2	1.9	0	0	1	1.0	1	1.0	4	3.9
___ 21-25	1	1.0	1	1.0	2	1.9	3	2.9	1	1.0
___ >25	1	1.0	3	2.9	9	8.7	17	16.4	6	5.8
___ none	9	8.7	7	6.7	25	24.0	37	35.6	26	25.0

3. How many days have you fished the North Fork Coeur d'Alene River in the last 12 months? _____days

	Section 1	Section 2	Section 3	Section 4	Section 5
N	9	7	25	37	26
Minimum	0	1.0	1.0	0	1
Maximum	20.0	90.0	50.0	66.0	43.0
Median	10.0	20.0	4.0	8.0	3.0
Mean	8.9	26.1	7.5	14.0	6.0
Std. error	1.8	11.8	2.2	2.7	1.7

4. Do you fish on the North Fork Coeur d'Alene River (less often___, same___, more often___) now as you did in previous years?

	Section1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
Less	1	1.0	2	2.0	9	9.2	17	17.4	4	4.1
Same	4	4.1	1	1.0	8	8.2	14	14.3	12	12.2

Appendix A. Continued.

More	4	4.1	3	3.1	5	5.1	6	6.1	7	7.1

5. What type (s) of tackle do you fish with **most often** on the North Fork Coeur d'Alene River? (Please check one)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ bait	6	6.2	3	3.1	6	6.2	5	5.2	1	1.0
___ lures	1	1.0	3	3.1	11	11.3	25	25.8	22	22.7
___ flies	2	2.1	1	1.0	5	5.2	5	5.2	1	1.0

6. Which section of the North Fork Coeur d'Alene River do you most **prefer** to fish? (Please check one)

_1_ Yellow Dog Cr. downstream
_2_ Yellow Dog Cr. upstream.
_3_ tributaries to the N. F. Coeur d'Alene River below Yellow Dog Creek
_4_ No preference

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	2	1.9	5	4.9	13	12.6	15	14.5	2	1.9
2	2	1.9	0	0	1	1.0	9	8.7	20	19.4
3	2	1.9	1	1.0	3	2.9	3	2.9	0	0
4	3	2.9	1	1.0	8	7.8	10	9.7	3	2.9

Why do you prefer to fish in this section? (Please select all that apply)

_A_ number of fish caught
_B_ type of fish
_C_ distance from home
_D_ type of water
_E_ closeness to a road
_F_ closeness to a campground
_M_ other (please specify)______________________.
_G_ size of fish
_H_ fewer of people
_I_ type of fishing regulations
_J_ access
_K_ lack of a road
_L_ area is stocked with hatchery trout

	Section 1	Section 2	Section 3	Section 4	Section 5
A	5	2	9	14	12
B	1	3	0	3	2
C	0	1	5	8	2
D	0	0	3	5	3
E	0	0	0	2	0
F	0	0	0	0	1
G	1	0	0	0	1
H	0	0	0	0	1
I	0	1	2	1	2

J	0	0	2	0	0
K	0	0	0	1	0
L	0	0	0	1	0
M	0	0	3	1	0

7. Some anglers may **prefer** to fish one area but **actually fish** in another. In the last five years, which section of the North Fork Coeur d'Alene River did you **most often** fish? (Please check one)

_1_ Yellow Dog Cr. downstream
_2_ Yellow Dog Cr. upstream
_3_ tributaries to the N.F. Coeur d'Alene River below Yellow Dog Creek
_4_ all equally

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
1	3	3.0	6	6.0	16	16.2	19	19.2	3	3.0
2	2	2.0	0	0	2	2.0	7	7.1	17	17.2
3	2	2.0	0	0	4	4.0	3	3.0	2	2.0
4	1	1.0	1	1.0	2	2.0	7	7.1	2	2.0

Why did you actually fish this section most often? (Please select all that apply)

_A_ number of fish caught
_B_ type of fish
_C_ distance from home
_D_ type of water
_E_ closeness to a road
_F_ closeness to a campground
_G_ size of fish
_H_ fewer of people
_I_ type of fishing regulations
_J_ access
_K_ lack of a road
_L_ area is stocked with hatchery trout
_M_ other (please specify)________________________.

	Section 1	Section 2	Section 3	Section 4	Section 5
A	4	1	9	13	10
B	0	3	0	4	3
C	2	2	6	11	2
D	0	0	2	2	4
E	0	0	1	1	0
F	0	0	0	0	1
G	1	0	0	1	0
H	0	0	0	0	0
I	0	0	2	1	3
J	0	0	2	0	0
K	0	0	0	0	0
L	0	0	0	1	0

M	0	1	1	0	0

Please circle the number that best describes your feelings.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
8. I feel that fishing regulations for the North Fork Coeur d'Alene River are difficult to understand.	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	5	4.9	1	1.0	1	1.0	1	1.0
Section 2	1	1.0	3	2.9	0	0	2	1.9	1	1.0
Section 3	2	1.9	13	12.6	6	5.8	1	1.0	2	1.9
Section 4	6	5.8	20	19.4	1	1.0	9	8.7	1	1.0
Section 5	7	6.8	14	13.6	2	1.9	2	1.9	1	1.0
9. The current fishing regulations on the North Fork Coeur d'Alene River are easy to follow.	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	1.9	1	1.0	1	1.0	5	4.9	0	0
Section 2	1	1.0	2	1.9	0	0	4	3.9	0	0
Section 3	3	2.9	0	0	6	5.8	15	14.6	1	1.0
Section 4	0	0	9	8.7	0	0	21	20.4	6	5.8
Section 5	2	1.9	2	1.9	2	1.9	16	15.5	4	3.9

10. Are you familiar with the Fish and Game special brochure on fishing in the Spokane River drainage?

Section 1	Section 2		Section 3		Section 4		Section 5			
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Yes	1	1.0	0	0	3	2.9	9	8.7	6	5.8
___ No	8	7.7	7	6.7	22	21.2	28	26.9	20	19.2

If yes, Please rate the usefulness of this brochure to you in understanding the fishing regulations on the North Fork Coeur d'Alene River?

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
__ Poor	0	0	0	0	1	4.6	0	0	0	0
__Fair 0	0	0	0	0	0	4	18.2	1	4.6	
__Good	1	4.6	0	0	3	13.6	4	18.2	3	13.6
__Excellent	0	0	0	0	0	0	3	13.6	2	9.1

Please circle the number that best describes your feelings.

Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree

Appendix A. Continued.

11. I feel it is important to allow catch-and-release fishing on a portion of the North Fork Coeur d'Alene River.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	2	1.9	1	1.0	4	3.9	2	1.9
Section 2	0	0	1	1.0	0	0	3	2.9	3	2.9
Section 3	2	1.9	0	0	4	3.9	7	6.8	11	10.7
Section 4	3	2.9	2	1.9	6	5.8	12	11.7	14	13.6
Section 5	0	0	2	1.9	0	0	5	4.9	19	18.5

12. I would support expanding the catch-and-release section of the North Fork Coeur d'Alene River knowing that the harvest section would be smaller.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	1	1.0	1	1.0	4	3.9	2	1.9
Section 2	1	1.0	3	2.9	1	1.0	1	1.0	1	1.0
Section 3	7	6.7	6	5.8	7	6.7	3	2.9	2	1.9
Section 4	5	4.8	10	9.6	6	5.8	6	5.8	10	9.6
Section 5	2	1.9	1	1.0	3	2.9	3	2.9	17	16.4

13. I think it is important to allow harvest fishing on a portion of the North Fork Coeur d'Alene River.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	1.0	0	0	7	6.7	1	1.0
Section 2	0	0	0	0	1	1.0	5	4.8	1	1.0
Section 3	1	1.0	1	1.0	3	2.9	10	9.6	10	9.6
Section 4	4	3.9	2	1.9	4	3.9	22	21.2	5	4.8
Section 5	5	4.8	3	2.9	6	5.8	8	7.7	4	3.9

14. I would support expanding the harvest section of the North Fork Coeur d'Alene River knowing that the catch-and-release section would have to become smaller.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	2	1.9	2	1.9	4	3.9	0	0
Section 2	2	1.9	2	1.9	2	1.9	1	1.0	0	0
Section 3	3	2.9	10	9.6	4	3.9	5	4.8	3	2.9
Section 4	11	10.6	11	10.6	6	5.8	9	8.7	0	0
Section 5	16	15.4	6	5.8	1	1.0	3	2.9	0	0

15. I would prefer regulations which would result in me catching more fish, even if it meant I could keep fewer fish to take home.

Appendix A. Continued.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	0	0	2	1.9	7	6.7	0	0
Section 2	0	0	1	1.0	3	2.9	2	1.9	1	1.0
Section 3	4	3.9	6	5.8	7	6.7	5	4.8	3	2.9
Section 4	1	1.0	8	7.7	5	4.8	14	13.5	9	8.7
Section 5	1	1.0	1	1.0	6	5.8	5	4.8	13	12.5

16. I would prefer regulations which allow me to keep more fish now knowing it would result in fewer fish to catch on future trips.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	1.9	5	4.8	0	0	2	1.9	0	0
Section 2	1	1.0	3	2.9	2	1.9	1	1.0	0	0
Section 3	8	7.8	9	8.7	6	5.8	1	1.0	1	1.0
Section 4	17	16.5	16	15.5	3	2.9	1	1.0	0	0
Section 5	18	17.5	3	2.9	3	2.9	0	0	1	1.0

SECTION 2. These questions pertain to your feelings in general about trout fishing. Please circle the number that best describes your feelings.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	

1. I enjoy eating the trout I catch.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	1.0	1	1.0	4	3.9	3	2.9
Section 2	0	0	2	1.9	0	0	3	2.9	2	1.9
Section 3	0	0	4	3.9	1	1.0	11	10.6	9	8.7
Section 4	5	4.8	4	3.9	2	1.9	14	13.5	12	11.5
Section 5	9	8.7	3	2.9	1	1.0	7	6.7	6	5.8

2. I would rather catch one trophy trout than my limit of average size trout.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	4	3.9	0	0	3	2.9	1	1.0
Section 2	1	1.0	2	1.9	0	0	2	1.9	2	1.9
Section 3	3	2.9	11	10.6	2	1.9	7	6.7	2	1.9
Section 4	2	1.9	18	17.3	3	2.9	7	6.7	7	6.7
Section 5	2	1.9	4	3.9	2	1.9	6	5.8	12	11.5

3. I often share my trout catch with others.

	No.	%	No.	%	No.	%	No.	%	No.	%

Appendix A. Continued.

Section 1	0	0	4	3.9	0	0	5	4.9	0	0
Section 2	0	0	4	3.9	0	0	1	1.0	2	1.9
Section 3	5	4.9	11	10.7	0	0	6	5.8	3	2.9
Section 4	9	8.7	14	13.6	1	1.0	10	9.7	2	1.9
Section 5	13	12.6	5	4.9	1	1.0	6	5.8	1	1.0

4. I consider my fishing trip to be worthwhile, only if I catch trout.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	4	3.9	0	0	3	2.9	2	1.9
Section 2	0	0	4	3.9	0	0	2	1.9	1	1.0
Section 3	4	3.9	13	12.5	3	2.9	2	1.9	3	2.9
Section 4	6	5.8	17	16.4	0	0	10	9.6	4	3.9
Section 5	6	5.8	10	9.6	2	1.9	3	2.9	5	4.8

5. I release most of the trout I catch.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	0	0	0	0	7	6.7	2	1.9
Section 2	0	0	2	1.9	0	0	4	3.9	1	1.0
Section 3	1	1.0	5	4.8	3	2.9	10	9.6	6	5.8
Section 4	0	0	5	4.8	1	1.0	22	21.2	9	8.7
Section 5	1	1.0	0	0	0	0	8	7.7	17	16.4

6. I release all the trout I catch.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	8	7.8	0	0	0	0	1	1.0
Section 2	1	1.0	5	4.9	0	0	0	0	1	1.0
Section 3	7	6.8	14	13.6	1	1.0	0	0	3	2.9
Section 4	5	4.9	22	21.4	4	3.9	0	0	5	4.9
Section 5	2	1.9	5	4.9	3	2.9	1	1.0	15	14.6

7. Catching a limit of trout is important to me.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	4	3.9	1	1.0	3	2.9	0	0
Section 2	2	1.9	3	2.9	0	0	1	1.0	0	0
Section 3	2	1.9	15	14.7	4	3.9	4	3.9	1	1.0
Section 4	7	6.9	22	21.6	2	1.9	4	3.9	1	1.0
Section 5	17	16.7	6	5.9	1	1.0	1	1.0	1	1.0

8. I enjoy catching more trout than my friends.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	3	2.9	2	1.9	2	1.9	2	1.9
Section 2	1	1.0	2	1.9	0	0	3	2.9	1	1.0
Section 3	2	1.9	12	11.7	1	1.0	5	4.9	5	4.9
Section 4	8	7.8	13	12.6	8	7.8	5	4.9	2	1.9

Appendix A. Continued.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 5	6	5.8	9	8.7	2	1.9	4	3.9	5	4.9

9. I often keep all the trout I catch up to the legal limit.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	7	6.7	0	0	1	1.0	0	0
Section 2	0	0	4	3.9	0	0	3	2.9	0	0
Section 3	5	4.8	10	9.6	1	1.0	8	7.7	1	1.0
Section 4	11	10.6	18	17.3	1	1.0	7	6.7	0	0
Section 5	15	14.4	8	7.7	0	0	3	2.9	0	0

10. I feel stocked trout are as enjoyable to catch as wild trout.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	1	1.0	0	0	7	6.7	0	0
Section 2	0	0	4	3.9	1	1.0	2	1.9	0	0
Section 3	4	3.9	5	4.8	6	5.8	9	8.7	1	1.0
Section 4	3	2.9	14	13.5	9	8.7	7	6.7	4	3.9
Section 5	5	4.8	7	6.7	4	3.9	6	5.8	4	3.9

11. Fishing in stocked waters gives me a greater chance of catching trout.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	1.0	1	1.0	6	5.8	1	1.0
Section 2	0	0	2	1.9	1	1.0	3	2.9	1	1.0
Section 3	1	1.0	2	1.9	2	1.9	14	13.5	6	5.8
Section 4	1	1.0	5	4.8	3	2.9	25	24.0	3	2.9
Section 5	2	1.9	3	2.9	7	6.7	10	9.6	4	3.9

12. I try to fish streams shortly after they are stocked with trout.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	6	5.8	1	1.0	1	1.0	0	0
Section 2	0	0	5	4.9	0	0	2	1.9	0	0
Section 3	6	5.8	14	13.6	4	3.9	0	0	1	1.0
Section 4	7	6.8	22	21.4	6	5.8	2	1.9	0	0
Section 5	12	11.7	8	7.8	4	3.9	1	1.0	0	0

13. Stocking is important to maintain good trout fishing.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	1.0	2	1.9	4	3.9	2	1.9
Section 2	1	1.0	0	0	1	1.0	4	3.9	1	1.0
Section 3	2	1.9	3	2.9	7	6.7	7	6.7	6	5.8
Section 4	1	1.0	5	4.8	8	7.7	21	20.2	2	1.9
Section 5	5	4.8	3	2.9	9	8.7	7	6.7	2	1.9

14. How would you compare the number of trout you catch to that of other anglers? (Please check one)

Section 1	Section 2	Section 3	Section 4	Section 5

	No.	%	No.	%	No.	%	No.	%	No.	%
___ much less	0	0	0	0	2	2.0	1	1.0	0	0
___ less	2	2.0	2	2.0	4	4.0	6	5.9	6	5.9
___ same	6	5.9	2	2.0	13	12.9	11	10.9	7	6.9
___ more	1	1.0	2	2.0	4	4.0	14	13.9	12	11.9
___ much more	0	0	1	1.0	2	2.0	3	3.0	0	0

15. Do you belong to a local sportsman club (ie. rod and gun club or fishing club)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Yes	1	1.0	0	0	1	1.0	0	0	6	5.8
___ No	8	7.7	7	6.7	24	23.1	37	36.0	20	19.2

16. Do you belong to a National sportsman group?

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Yes	1	1.0	0	0	2	1.9	1	1.0	6	5.8
___ No	8	7.7	7	6.7	23	22.1	35	34.6	20	19.2

17. What sporting magazines or newspapers do you receive? (Please select all that apply)

_A_ Trout
_B_ Hunting and Fishing News
_C_ In Fisherman
_D_ Sports Afield
_E_ Idaho Wildlife
_F_ Outdoor Life
_G_ Field and Stream
_H_ Fly Fisherman
_I_ Others (please list) ____________, ____________, ____________
_J_ None

	Section 1	Section 2	Section 3	Section 4	Section 5
A	0	0	0	0	5
B	1	1	2	1	1
C	0	0	0	1	1
D	2	1	2	3	2
E	0	0	0	1	0
F	1	0	7	7	3
G	0	1	0	1	0
H	0	0	1	0	5
I	0	0	0	6	2
J	5	4	12	16	7

18. Where do you receive your information on Idaho's fish and wildlife resources? (Please check all that apply)

	Section 1	Section 2	Section 3	Section 4	Section 5
___ Newspapers	1	3	11	16	9
___ Radio	0	0	0	0	0
___ Television	0	0	0	1	0
___ Regulations brochures	5	1	7	13	5

___ Brochures/pamphlets	0	1	0	0	1
___ Local sporting goods store	0	2	2	2	2
___ Family and friends	0	0	1	1	4
___ Department publications (Idaho Wildlife Magazine, Fish and Game News)	1	0	0	0	0
___ Do not know	0	0	0	0	0
___ Have not received information	1	0	2	0	0
___ other	0	0	1	0	0

SECTION 3. These questions pertain to the section of the North Fork Coeur d'Alene River ***downstream of Yello Dog Creek.*** Please answer the following questions ***even if you do not fish*** the section from Yellow Dog Creek downstream.

1. Do you fish the section of the North Fork Coeur d'Alene River **downstream from Yellow Dog Creek**?

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___Yes	6	5.8	7	6.8	22	21.4	35	34.0	11	10.7
___No	1	1.0	0	0	1	1.0	2	1.9	14	13.6
___Don't know 2	1.9	0	0	2	1.9	0	0	0	0	

2. In general, I feel fishing regulations for **this section** of the North Fork Coeur d'Alene River allow me to keep enough fish. (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Strongly disagree	0	0	1	1.0	3	2.9	2	2.0	2	2.0
___ Disagree	1	1.0	1	1.0	5	4.9	8	7.9	2	2.0
___ Neutral	3	2.9	0	0	3	2.9	6	5.9	7	6.9
___ Agree	5	4.9	4	3.9	11	10.8	12	11.8	11	10.8
___ Strongly agree	0	0	1	1.0	3	2.9	9	8.8	2	2.0

3. If the number of hatchery trout stocked **in this section** was **decreased,** my fishing effort **on the this section** of the river would (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this portion entirely	0	0	0	0	2	2.0	0	0	0	0
___ Decrease considerably	2	2.0	2	2.0	1	1.0	3	3.0	1	1.0
___ Decrease some	3	3.0	0	0	7	6.9	6	5.9	5	4.9
___ Stay the same	3	3.0	5	4.9	14	13.9	27	26.7	14	13.9
___ Increase some	0	0	0	0	1	1.0	1	1.0	3	3.0
___ Increase considerably	0	0	0	0	0	0	0	0	1	1.0

Appendix A. Continued.

4. If hatchery stocking were stopped in this section, how would this change affect your fishing activity on **this section** of the North Fork Coeur d'Alene River. (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this section	1	1.0	1	1.0	1	1.0	0	0	0	0
___ I would decrease my fishing activity	3	3.0	1	1.0	8	7.8	8	7.8	2	2.0
___ My fishing activity would remain the same	5	4.9	4	3.9	15	14.7	28	27.5	15	14.7
___ I would increase my fishing activity	0	0	1	1.0	0	0	1	1.0	6	5.9
___ I would begin fishing	0	0	0	0	1	1.0	0	0	1	1.0

5. Due to the cost of raising hatchery trout ($.60 each to rear and stock), the Department tries to stock trout on where at least 40% of the fish stocked are caught (this costs $1.50 per fish caught). I would support eliminating stocking in the North Fork Coeur d'Alene River where less than 40% of the fish stocked were caught.

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Yes	5	5.0	4	4.0	9	8.9	17	16.8	14	13.9
___ No	4	4.0	3	3.0	16	15.8	19	18.8	10	9.9

6. I would support the elimination of stocking hatchery trout in the section of North Fork Coeur d'Alene River ***from Yellow Dog Creek downstream***, if ponds were constructed along the river and stocked with hatchery trout I could keep.

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Yes	5	5.0	3	3.0	4	4.0	4	4.0	5	5.0
___ No	4	4.0	4	4.0	20	20.2	31	31.3	19	19.2

7. If opportunity to keep fish was eliminated on the section of the North Fork Coeur d'Alene River ***from Yellow Dog Creek downstream to Lost Creek***, how would this change affect your fishing activity in this section? (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ I would begin fishing in this section in this section	0	0	0	0	0	0	1	1.0	6	5.8
___ I would increase my fishing activity in this section	1	1.0	1	1.0	1	1.0	6	5.8	7	6.7
___ My fishing activity would remain the same in this section	6	5.8	2	1.9	8	7.7	16	15.4	9	8.7

Appendix A. Continued.

	Section 1 No.	%	Section 2 No.	%	Section 3 No.	%	Section 4 No.	%	Section 5 No.	%
___ I would decrease my fishing activity in this section	0	0	4	3.9	5	4.8	9	8.6	1	1.0
___ I would stop fishing this section	2	1.9	0	0	10	9.6	5	4.8	2	1.9

8. If it were unlawful to use bait in the North Fork Coeur d'Alene River ***from Yellow Dog Creek downstream to Lost Creek***, my fishing effort **on this section** would (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this portion entirely	0	0	0	0	1	1.0	0	0	1	1.0
___ Decrease considerably	1	1.0	0	0	2	1.9	3	2.9	0	0
___ Decrease some	1	1.0	4	3.9	4	3.9	3	2.9	1	1.0
___ Not change	3	2.9	1	1.0	4	3.9	5	4.8	2	1.9
___ Increase some	4	3.9	2	1.9	9	8.7	19	18.3	8	7.7
___ Increase considerably	0	0	0	0	3	2.9	3	2.9	7	6.7

Appendix A. Continued.

SECTION 4. This section pertains **only to the tributaries** of the North Fork Coeur d'Alene River from ***Yellow Do Creek downstream.***

1. Do you fish in the tributaries to the North Fork Coeur d'Alene River downstream of Yellow Dog Creek?

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Yes	4	3.9	5	4.9	13	12.6	20	19.4	7	6.8
___ No	5	4.9	2	1.9	11	10.7	17	16.5	19	18.5

2. In the last 12 months, how many days have you fished in the tributaries to the North ForkCoeur d'Alene River downstream of Yellow Dog Creek? (Please check one)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ 1-5	2	2.0	1	1.0	12	12.1	9	9.1	6	6.1
___ 6-10	2	2.0	2	2.0	2	2.0	4	4.0	1	1.0
___ 11-15	1	1.0	1	1.0	0	0	2	2.0	0	0
___ 16-20	0	0	0	0	0	0	2	2.0	0	0
___ 21-25	0	0	0	0	0	0	0	0	1	1.0
___ >25	0	0	1	1.0	1	1.0	1	1.0	0	0
___ none	0	0	0	0	0	0	0	0	0	0

3. In general, I feel that fishing regulations on the tributaries in **this section** of the North Fork Coeur d'Alene River allow me to keep enough fish (current limit for trout is six fish). (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Strongly disagree	0	0	0	0	1	1.0	1	1.0	2	2.1
___ Disagree	0	0	0	0	1	1.0	1	1.0	0	0
___ Neutral	7	7.2	1	1.0	5	5.2	13	13.4	7	7.2
___ Agree	2	2.1	6	6.2	11	11.3	15	15.5	6	6.2
___ Strongly agree	0	0	0	0	3	3.1	7	7.2	8	8.3

4. If the bag limit was reduced on the tributaries, how would this change affect your fishing activity in these streams? (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this section	0	0	1	1.0	2	2.1	1	1.0	0	0
___ I would decrease my fishing activity	1	1.0	2	2.1	3	3.1	4	4.2	1	1.0
___ My fishing activity would remain the same	7	7.3	3	3.1	15	15.6	28	29.2	17	17.7
___ I would increase my fishing activity	0	0	1	1.0	1	1.0	2	2.1	1	1.0

Appendix A. Continued.

___ I would begin fishing	0	0	0	0	0	0	2	2.1	4	4.2

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
5. It is important to me to have uniform regulations on the tributaries and the mainstem knowing that harvest may be reduced.										
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	1.0	4	3.9	4	3.9	0	0
Section 2	1	1.0	0	0	2	1.9	4	3.9	0	0
Section 3	2	1.9	4	3.9	7	6.7	5	4.8	3	2.9
Section 4	0	0	5	4.8	11	10.6	15	14.4	4	3.9
Section 5	1	1.0	4	3.9	4	3.9	7	6.7	7	6.7
6. It is important to me to have the opportunity to harvest a limit of fish in the tributaries knowing that fishing regulations would be more complicated.										
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	3	2.9	3	2.9	2	1.9	0	0
Section 2	1	1.0	3.	2.9	0	0	2	1.9	1	1.0
Section 3	2	1.9	9	8.7	4	3.9	4	3.9	2	1.9
Section 4	5	4.8	17	16.4	11	10.6	2	1.9	0	0
Section 5	10	9.6	6	5.8	6	5.8	0	0	0	0

SECTION 5. These questions pertain to **guided fishing trips** on the North Fork Coeur d'Alene River. (Please ci the number that best describes your feelings).

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
1. Commercially **guided walk and wade** fishing trips are appropriate on the North Fork Coeur d'Alene River.										
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	3	3.1	2	2.1	3	3.1	1	1.0	0	0
Section 2	2	2.1	2	2.1	1	1.0	1	1.0	0	0
Section 3	12	12.5	3	3.1	4	4.2	3	3.1	0	0
Section 4	10	10.4	11	11.5	7	7.3	4	4.2	1	1.0
Section 5	5	5.2	5	5.2	7	7.3	6	6.3	3	3.1

Appendix A. Continued.

2. Commercially **guided float boat** fishing trips are appropriate on the North Fork Coeur d'Alene River.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	3	3.1	3	3.1	3	3.1	0	0	0	0
Section 2	3	3.1	2	2.1	0	0	1	1.0	0	0
Section 3	10	10.4	4	4.2	5	5.2	3	3.1	0	0
Section 4	13	13.5	10	10.4	7	7.3	3	3.1	0	0
Section 5	10	10.4	6	6.3	5	5.2	3	3.1	2	2.1

3. The number of guided fishing trips on the North Fork Coeur d'Alene River is

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
too low___	0	0	0	0	0	0	0	0	3	3.1
just right___	1	1.0	1	1.0	2	2.1	3	3.1	2	2.1
too high___	0	0	1	1.0	4	4.1	3	3.1	6	6.1
don't know ____.	8	8.2	5	5.1	15	15.3	29	29.6	15	15.3

SECTION 6. The following questions pertain to your overall knowledge of the Department of Fish and Game.

1. How well does the Department manage the supply of game fish for fishing in the North Fork Coeur d'Alene River?

	Poor		Fair		Good		Excellent		Don't know	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	2	1.9	5	4.9	0	0	2	1.9
Section 2	0	0	2	1.9	2	1.9	0	0	3	2.9
Section 3	0	0	8	7.8	7	6.8	3	2.9	6	5.8
Section 4	2	1.9	8	7.8	10	9.7	4	3.9	13	12.6
Section 5	0	0	7	6.8	10	9.7	2	1.9	7	6.8

2. How well does the Department manage and protect the fish resources in the North Fork Coeur d'Alene River?

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	2	2.0	4	3.9	1	1.0	2	2.0
Section 2	1	1.0	0	0	3	2.9	0	0	3	2.9
Section 3	1	1.0	3	2.9	10	9.8	5	4.9	5	4.9
Section 4	5	4.9	3	2.9	10	9.8	9	8.8	9	8.8
Section 5	1	1.0	7	6.9	10	9.8	3	2.9	5	4.9

Appendix A. Continued.

3. How well does the Department manage and protect fish habitat in the North Fork Coeur d'Alene River?

	Poor		Fair		Good		Excellent		Don't know	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	0	0	6	5.9	0	0	2	2.0
Section 2	2	2.0	0	0	2	2.0	0	0	3	2.9
Section 3	2	2.0	5	4.9	9	8.8	5	4.9	3	2.9
Section 4	6	5.9	4	3.9	9	8.8	6	5.9	11	10.8
Section 5	1	1.0	9	8.8	9	8.8	2	2.0	5	4.9

4. How well has the Department incorporated sportsmen's wants and needs into management of the North Fork Coeur d'Alene River?

	Poor		Fair		Good		Excellent		Don't know	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	1.0	1	1.0	4	3.9	1	1.0	2	1.9
Section 2	0	0	0	0	4	3.9	0	0	3	2.9
Section 3	0	0	5	4.9	10	9.7	3	2.9	6	5.8
Section 4	5	4.8	6	5.8	6	5.8	5	4.8	15	14.6
Section 5	2	1.9	8	7.8	6	5.8	4	3.9	6	5.8

SECTION 7. The following questions are optional, but will help us better understand the anglers who fish the N Fork Coeur d'Alene River drainage.

1. What is your gender?

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___Male	8	7.8	7	6.8	22	21.4	33	32.0	26	25.
___Female	1	1.0	0	0	2	1.9	4	3.9	0	0

2. What is your marital status?

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
____ Single	4	3.9	3	2.9	10	9.7	7	6.8	5	4.9
____ Married	5	4.9	4	3.9	14	13.6	30	29.1	21	20.4

3. Do you have any children living at home?

Appendix A. Continued.

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
___ Yes	4	3.9	4	3.9	12	11.7	12	11.7	9	8.7
___ No	5	4.9	3	2.9	12	11.7	25	24.3	17	16.5

4. Please select the response that best describes the area where you live. (Please check one)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
rural area	3	2.9	0	0	3	2.9	1	1.0	2	1.9
suburb	2	1.9	2	1.9	7	6.8	13	12.6	5	4.9
small town (less than 4,999)	0	0	1	1.0	2	1.9	8	7.8	7	6.7
small city (5,000 to 49,999)	0	0	1	1.0	1	1.0	4	3.9	0	0
large city (50,000 to 500,000)	4	3.9	3	2.9	11	10.7	10	9.7	12	11.7
very large city (over 500,000)	0	0	0	0	0	0	1	1.0	0	0

5. What is the highest level of education you have completed? (Please check one)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
some high school	1	1.0	0	0	2	1.9	0	0	0	0
high school graduate	1	1.0	0	0	3	2.9	3	2.9	3	2.9
some college	2	1.9	0	0	2	0	6	5.8	1	1.0
college graduate	4	3.9	3	2.9	9	8.7	16	15.5	9	8.7
graduate or professional degree	1	1.0	1	1.0	6	5.8	4	3.9	11	10.7
trade or technical school	0	0	3	2.9	2	1.9	8	7.8	2	1.9

6. Which category best describes your occupation. (Please check one)

	Section 1		Section 2		Section 3		Section 4		Section 5	
	No.	%	No.	%	No.	%	No.	%	No.	%
____professional/technical	1	1.0	3	2.9	4	3.9	9	8.7	8	7.7
____service worker	0	0	0	0	0	0	1	1.0	0	0
____skilled worker	2	1.9	2	1.9	12	11.7	4	3.9	6	5.8
____farmer	0	0	0	0	0	0	0	0	0	0
____skilled worker/operator	3	2.9	0	0	2	1.9	5	4.8	3	2.9
____student	0	0	1	1.0	0	0	0	0	0	0
____unskilled laborer	0	0	0	0	1	1.0	0	0	0	0
____retired	2	1.9	0	0	1	1.0	7	6.7	1	1.0
____clerical/sales	0	0	0	0	1	1.0	0	0	0	0
____housewife	0	0	0	0	0	0	0	0	0	0
____logger	0	0	0	0	0	0	1	1.0	0	0
____self-employed business	0	0	1	1.0	0	0	5	4.9	6	5.8
____miner	0	0	0	0	0	0	0	0	0	0
____other	1	1.0	0	0	2	1.9	3	2.9	2	1.9

7. Please give your age. _________ Years

Appendix A. Continued.

	Section 1	Section 2	Section 3	Section 4	Section 5
N	9	7	25	37	26
Minimum	21	31	0	24	24
Maximum	64	51	79	80	77
Median	37	38	29	45	42
Mean	39	38	33	46	43
Std. error	4.7	2.7	3.4	2.4	2.8

Thank you for your time and assistance in completing this questionnaire. Your assistance will help expand our understanding of the men and women involved with the fishing in the Spokane drainage.

Appendix B. Summary of angler opinion survey for the St. Joe River, Idaho by river section, 1996.

SPOKANE RIVER DRAINAGE ANGLER SURVEY

SECTION 1. These questions pertain to the **ST. JOE RIVER only.**

1. How many years have you fished the St. Joe River at least once?

	Section 1	Section 2	Section 3	Section 4
N	7	21	67	141
Minimum	5	0	0	0
Maximum	66	64	40	56
Median	20	15	6	5
Mean	28	17	9.5	8.8
Std. error	8.6	3.9	1.3	0.8

2. How many days in the past 5 years have you fished the St. Joe River? (Please check one)

	Section 1		Section 2		Section 3		Section 4	
No. %	No.	%	No.	%	No.	%		
___ 1-5	1	0.5	2	0.9	15	6.8	35	15.8
___ 6-10	0	0	2	0.9	10	4.5	21	9.5
___ 11-15	0	0	3	1.4	5	2.3	14	6.3
___ 16-20	1	0.5	2	0.9	1	0.5	12	5.4
___ 21-25	0	0	0	0	8	3.6	5	2.3
___ >25	5	2.3	4	1.8	23	10.4	53	23.9
___ none	0	0	0	0	0	0	0	0

3. How many days have you fished the St. Joe River in the last 12 months?

	Section 1	Section 2	Section 3	Section 4
N	7	21	67	141
Minimum	4	1	1	0
Maximum	60	24	60	30
Median	18	3	4	5
Mean	21.3	6.7	8.9	7.4
Std. error	7.0	1.5	1.3	0.5

4. Do you fish on the St. Joe River (less often___, same___, more often___) now as you did in previous years?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
Less often	1	0.5	4	1.9	11	5.2	22	10.4
Same	3	1.4	5	2.4	28	13.2	61	28.8
More often	3	1.4	3	1.4	23	10.9	46	21.7

5. What type (s) of tackle do you fish with **most often** on the St. Joe River? (Please check one)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ bait	1	0.5	2	0.9	19	8.9	0	0

Appendix B. Continued.

___ lures	3	1.4	4	1.9	8	3.7	9	4.2
___ flies	3	1.4	5	2.3	30	14.0	130	60.8

6. Which section of the St. Joe River do you most **prefer** to fish? (Please check one)

_1_ Prospector Cr. downstream
_2_ Prospector Cr. upstream to SpruceTree CG
_3_ SpruceTree CG upstream
_4_ No preference
_5_ Marble Creek
_6_ North Fork St. Joe
_7_ Other tributaries

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
1	3	1.5	5	2.4	28	13.6	4	1.9
2	1	0.5	2	1.0	13	6.3	75	36.4
3	0	0	1	0.5	3	1.0	27	13.1
4	2	1.0	2	1.0	13	6.3	16	7.8
5	1	0.5	1	0.5	1	.05	2	1.0
6	0	0	0	0	3	1.5	1	0.5
7	0	0	0	0	0	0	0	0

Why do you prefer to fish in this section? (Please select all that apply)

_A_ number of fish caught
_B_ type of fish
_C_ distance from home
_D_ type of water
_E_ closeness to a road
_F_ closeness to a campground
_G_ size of fish
_H_ fewer of people
_I_ type of fishing regulations
_J_ access
_K_ lack of a road
_L_ area is stocked with hatchery trout
_M_ other (please specify)________________________.

	Section 1	Section 2	Section 3	Section 4
A	1	10	34	80
B	0	1	2	9
C	3	2	2	1
D	1	6	9	16
E	0	0	1	3
F	1	0	0	4
G	1	0	3	3
H	0	0	0	6
I	0	1	4	1
J	0	0	1	0
K	0	0	0	2
L	0	0	1	0
M	0	0	3	5

Appendix B. Continued.

7. Some anglers may **prefer** to fish one area but **actually fish** in another. In the last five years, which secti of the St. Joe River did you **most often** fish? (Please check one)

_1_ Prospector Cr. downstream _5_ Marble Cr.
_2_ Prospector Cr. upstream to SpruceTree CG _6_ North Fork St. Joe River
_3_ SpruceTree CG upstream _7_ other tributaries
_4_ all equally

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
1	3	1.5	7	3.4	32	15.5	10	4.9
2	1	0.5	1	0.5	16	7.8	86	41.8
3	0	0	1	0.5	3	1.4	15	7.3
4	1	0.5	1	0.5	4	1.9	9	4.4
5	2	1.0	1	0.5	2	1.0	1	0.5
6	0	0	1	0.5	4	1.9	3	1.5
7	0	0	0	0	0	0	0	0

Why did you actually fish this section most often? (Please select all that apply)

_A_ number of fish caught _G_ size of fish
_B_ type of fish _H_ fewer of people
_C_ distance from home _I_ type of fishing regulations
_D_ type of water _J_ access
_E_ closeness to a road _K_ lack of a road
_F_ closeness to a campground _L_ area is stocked with hatchery trout
_M_ other (please specify)__________________________.

	Section 1	Section 2	Section 3	Section 4
A	1	9	31	67
B	0	1	2	10
C	2	3	3	7
D	1	3	9	14
E	0	1	1	5
F	1	1	1	7
G	1	0	2	1
H	0	0	2	8
I	0	1	4	3
J	0	0	2	1
K	0	0	0	0
L	0	0	0	0
M	0	0	6	2

Please circle the number that best describes your feelings.

8. I feel that fishing regulations for the St. Joe River are difficult to understand.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	0.9	3	1.4	0	0	2	0.9	0	0

Appendix B. Continued.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 2	4	1.8	5	2.3	0	0	3	1.4	1	0.9
Section 3	16	7.2	33	14.9	4	1.8	7	3.2	3	1.4
Section 4	52	23.4	71	32.0	7	3.2	7	3.2	2	0.9

9. The current fishing regulations on the St. Joe River are easy to follow.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	0.5	0	0	4	1.8	2	0.9
Section 2	0	0	5	2.3	0	0	4	1.8	4	1.8
Section 3	4	1.8	5	2.3	5	2.3	37	16.7	11	5.0
Section 4	7	3.2	5	2.3	7	3.2	79	35.8	41	18.6

10. Are you familiar with the Fish and Game special brochure on fishing in the Spokane River drainage?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Yes	0	0	1	0.5	7	3.1	29	13
___ No	7	3.1	12	5.4	55	24.7	112	50.2

If yes, Please rate the usefulness of this brochure to you in understanding the fishing regulations on the St. Joe River?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Poor	0	0	1	2.7	0	0	0	0
___Fair	0	0	0	0	1	2.7	4	10.8
___Good	0	0	0	0	5	13.5	21	56.8
___Excellent	0	0	0	0	1	2.7	4	10.8

Please circle the number that best describes your feelings.

11. I feel it is important to allow catch-and-release fishing on a portion of the St. Joe River.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	0.5	0	0	1	0.5	3	1.4	2	0.9
Section 2	1	0.5	0	0	2	0.9	3	1.4	7	3.1
Section 3	2	0.9	0	0	2	0.9	17	7.6	42	18.8
Section 4	1	0.5	2	0.9	0	0.9	21	9.4	114	51.1

12. I would support expanding the catch-and-release section of the St. Joe River knowing that the harvest section would be smaller.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	3	1.3	1	0.5	1	0.5	2	0.9	0	0

Appendix B. Continued.

Section 2	3	1.3	3	1.3	1	0.5	1	0.5	5	2.2
Section 3	13	5.8	12	5.4	9	4.0	5	2.2	24	10.7
Section 4	6	2.7	9	4.0	11	4.9	26	11.6	89	39.7

13. I think it is important to allow harvest fishing on a portion of the St. Joe River.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	0	0	0	0	4	1.8	3	1.4
Section 2	2	0.9	2	0.9	0	0	5	2.3	3	1.4
Section 3	5	2.3	3	1.4	4	1.8	30	13.5	20	9.0
Section 4	26	11.7	21	9.5	25	11.3	57	25.7	12	5.4

14. I would support expanding the harvest section of the St. Joe River knowing that the catch-and-release section would have to become smaller.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	0.9	3	1.4	1	0.5	1	0.5	0	0
Section 2	4	1.8	5	2.2	0	0	1	0.5	2	0.9
Section 3	29	13.0	20	9.0	6	2.7	4	1.8	4	1.8
Section 4	100	44.8	27	12.1	6	2.7	4	1.8	4	1.8

15. I would prefer regulations which would result in me catching more fish, even if it meant I could keep fewer fish to take home.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	0.5	3	1.4	2	0.9	0	0
Section 2	0	0	3	1.4	0	0	5	2.3	4	1.8
Section 3	4	1.8	13	5.9	6	2.7	13	5.9	27	12.2
Section 4	8	3.6	9	4.1	10	4.5	33	14.9	80	36.2

16. I would prefer regulations which allow me to keep more fish now knowing it would result in fewer fish to catch on future trips.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	3	1.4	3	1.4	1	0.5	0	0	0	0
Section 2	5	2.3	5	2.3	2	0.9	0	0	0	0
Section 3	37	16.7	21	9.5	1	0.5	2	0.9	2	0.9
Section 4	108	48.7	22	9.9	5	2.3	3	1.4	2	0.9

SECTION 2. These questions pertain to your feelings in general about trout fishing. Please circle the number that best describes your feelings.

Appendix B. Continued.

1. I enjoy eating the trout I catch.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	0.5	0	0	3	1.4	3	1.4
Section 2	1	0.5	3	1.4	0	0	6	2.8	2	0.9
Section 3	7	3.2	6	2.8	5	2.3	28	12.8	15	6.9
Section 4	32	14.7	45	20.6	8	3.7	44	20.2	9	4.[illegible]

2. I would rather catch one trophy trout than my limit of average size trout.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	3	1.4	0	0	4	1.8	0	0
Section 2	0	0	5	2.3	1	0.5	3	1.4	4	1.8
Section 3	6	2.7	14	6.3	11	5.0	20	9.1	12	5.4
Section 4	10	4.5	23	10.4	23	10.4	47	21.3	35	15

3. I often share my trout catch with others.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	3	1.4	1	0.5	2	0.9	1	0.5	0	0
Section 2	2	0.9	5	2.3	1	0.5	5	2.3	0	0
Section 3	19	8.7	18	8.2	6	2.7	14	6.4	6	2.[illegible]
Section 4	67	30.6	41	18.7	13	5.9	12	5.5	3	1.4

4. I consider my fishing trip to be worthwhile, only if I catch trout.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	0.5	3	1.4	1	0.5	1	0.5	1	0.[illegible]
Section 2	2	0.9	4	1.8	2	0.9	5	2.3	0	0
Section 3	21	9.5	21	9.5	4	1.8	8	3.6	8	3.6
Section 4	26	11.8	39	17.7	15	6.79	36	16.3	23	10

5. I release most of the trout I catch.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	2	0.9	0	0	4	1.8	1	0.[illegible]
Section 2	0	0	2	0.9	0	0	5	2.3	6	2.8
Section 3	1	0.5	3	1.4	2	0.9	27	12.5	29	1.[illegible]
Section 4	9 4.2	6	2.8	1	0.5	28	13.0	90	41.7	

6. I release all the trout I catch.

	Strongly Disagree		Disagree		Undecided		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	6	2.7	0	0	0	0	1	0.[illegible]
Section 2	1	0.5	6	2.7	0	0	3	1.4	3	1.4
Section 3	10	4.5	22	10.0	4	1.8	8	3.6	18	8.[illegible]
Section 4	1	0.5	23	10.4	3	1.4	24	10.9	88	39

Appendix B. Continued.

7. Catching a limit of trout is important to me.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	0.9	3	1.4	0	0	2	0.9	0	0
Section 2	4	1.8	5	2.3	3	1.4	1	0.5	0	0
Section 3	20	9.1	23	10.5	4	1.8	13	5.9	3	1.4
Section 4	68	30.9	49	22.3	13	5.9	5	2.3	2	0.9

8. I enjoy catching more trout than my friends.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	0.9	2	0.9	1	0.5	2	0.9	0	0
Section 2	1	0.5	5	2.3	2	0.9	4	1.8	0	0
Section 3	9	4.1	15	6.9	7	3.2	18	8.3	13	6.0
Section 4	24	11.0	28	12.8	27	12.4	38	17.4	20	9.2

9. I often keep all the trout I catch up to the legal limit.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	0.5	2	0.9	0	0	4	1.8	0	0
Section 2	7	3.1	3	1.4	0	0	2	0.9	0	0
Section 3	26	11.7	24	10.8	3	1.4	8	3.6	2	0.9
Section 4	101	45.3	28	12.6	2	0.9	9	4.0	1	0.5

10. I feel stocked trout are as enjoyable to catch as wild trout.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	0.9	2	0.9	0	0	2	0.9	1	0.5
Section 2	2	0.9	3	1.4	1	0.5	6	2.7	1	0.5
Section 3	14	6.3	10	4.5	11	4.9	17	7.6	11	4.9
Section 4	47	21.0	39	17.4	24	10.7	22	9.8	9	4.0

11. Fishing in stocked waters gives me a greater chance of catching trout.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	2	0.9	1	0.5	3	1.4	0	0
Section 2	0	0	5	2.2	2	0.9	5	2.2	1	0.5
Section 3	7	3.1	1	0.5	10	4.5	30	13.5	15	13.[illegible]
Section 4	21	9.4	23	10.3	40	17.9	48	21.5	9	4.0

12. I try to fish streams shortly after they are stocked with trout.

Appendix B. Continued.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	0.9	4	1.8	1	0.5	0	0	0	0
Section 2	3	1.4	6	2.7	1	0.5	3	1.4	0	0
Section 3	16	7.2	27	12.1	14	6.3	4	1.8	1	0.5
Section 4	66	29.6	50	22.4	22	9.9	3	1.4	0	0

13. Stocking is important to maintain good trout fishing.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	1	0.5	0	0	2	0.9	2	0.9	2	0.9
Section 2	3	1.4	1	0.5	1	0.5	8	3.6	0	0
Section 3	3	1.4	4	1.8	15	6.7	29	13.0	12	5.4
Section 4	43	19.3	17	7.6	44	19.7	26	11.7	10	4.5

14. How would you compare the number of trout you catch to that of other anglers? (Please check one)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ much less	0	0	1	0.5	5	2.3	1	0.5
___ less	1	0.5	3	1.4	7	3.2	14	6.3
___ same	3	1.4	4	1.8	22	10.0	47	21.3
___ more	2	0.9	5	2.3	18	8.1	61	27.6
___ much more 1	0.5	0	0	10	4.5	16	7.2	

15. Do you belong to a local sportsman club (ie. rod and gun club or fishing club)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Yes	0	0	1	0.5	2	0.9	19	8.6
___ No	7	3.2	12	5.4	60	27.0	121	54.5

16. Do you belong to a national sportsman group?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Yes	0	0	1	0.5	5	2.2	32	14.3
___ No 7	3.1	12	5.4	58	25.9	109	48.7	

17. What sporting magazines or newspapers do you receive? (Please select all that apply)

_A_ Trout _D_ Outdoor Life _E_ Sports Afield _G_ Field and Stream
_B_ Hunting and Fishing News _F_ Idaho Wildlife _H_ Fly Fisherman
_C_ In Fisherman
_I_ Others (please list) ____________, ____________, ____________
_J_ None

	Section 1	Section 2	Section 3	Section 4
A	0	0	2	14

Appendix B. Continued.

B	0	3	2	4
C	0	0	1	3
D	1	1	11	15
E	0	2	0	3
F	0	0	2	6
G	1	2	2	7
H	0	0	2	31
I	1	3	9	8
J	4	10	35	49

18. Where do you receive your information on Idaho's fish and wildlife resources? (Please checkall that apply)

	Section 1	Section 2	Section 3	Section 4
___ Newspapers	4	5	28	59
___ Radio	0	0	1	1
___ Television	0	0	0	0
___ Regulations brochures	1	9	12	37
___ Brochures/pamphlets	0	2	2	3
___ Local sporting goods store	1	0	8	9
___ Family and friends	0	2	6	20
___ Department publications (Idaho Wildlife Magazine, Fish and Game News)	0	0	3	2
___ Do not know	1	0	0	0
___ Have not received information	0	1	3	2
___ other (please specify	0	1	1	1

SECTION 3. These questions pertain to the section of the St. Joe River ***downstream of Prospector Creek.*** Please answer the following questions ***even if you do not fish*** the section from Prospector Creek downstream.

1. Do you fish the section of the St. Joe River from old railroad bridge at Fall Creek upstream to Prospector Creek?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___Yes	7	3.2	11	5.0	46	20.7	57	25.7
___No	0	0	1	0.5	10	4.5	64	28.8
___Don't know	0	0	1	0.5	7	3.2	18	8.1

2. In general, I feel fishing regulations for **this section** of the St. Joe River allow me to keep enoughfish. (Please select the one that best describes your feelings)

Appendix B. Continued.

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Strongly disagree	0	0	0	0	2	0.9	5	2.4
___ Disagree	3	1.4	4	1.8	3	1.4	7	3.3
___ Neutral	1	0.5	2	0.9	13	6.1	57	26.8
___ Agree	2	0.9	4	1.8	29	13.6	27	12.7
___ Strongly agree	1	0.5	3	1.4	16	7.5	34	16.0

3. If opportunity to keep fish was eliminated on this section of the St. Joe River **from old railroad bridge at Fall Creek upstream to Prospector Creek**, how would this change affect your fishing activity in this section? (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ I would begin fishing in this section in this section	0	0	1	0.5	3	1.4	40	18.5
___ I would increase my fishing activity in this section	0	0	3	1.4	13	6.0	41	19.0
___ My fishing activity would remain the same in this section	4	1.8	3	1.4	24	11.1	44	20.4
___ I would decrease my fishing activity in this section	2	0.9	1	0.5	16	7.4	7	3.2
___ I would stop fishing this section	1	0.5	5	2.3	6	2.8	2	0.9

4. If it were unlawful to use bait **in this section** of the St. Joe River, my fishing effort **on this section** would (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this portion entirely	1	0.5	3	1.4	9	4.2	0	0
___ Decrease considerably	1	0.5	1	0.5	10	4.6	2	0.9
___ Decrease some	1	0.5	0	0	7	3.2	3	1.4
___ Not change	4	1.9	4	1.9	21	9.7	54	25.0
___ Increase some	0	0	1	0.5	7	3.2	37	17.1
___ Increase considerably	0	0	4	1.9	8	3.7	38	17.6

Appendix B. Continued.

5. If the number of hatchery trout stocked **in this section** was **decreased,** my fishing effort **on the this section** of the river would (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this portion entirely	0	0	0	0	1	0.5	2	0.9
___ Decrease considerably	0	0	1	0.5	1	0.5	2	0.9
___ Decrease some	2	0.9	1	0.5	9	4.1	14	6.4
___ Stay the same	5	2.3	9	4.1	44	20.1	79	34.1
___ Increase some	0	0	0	0	4	1.8	24	11.0
___ Increase considerably	0	0	2	0.9	4	1.8	15	6.9

6. If hatchery stocking were stopped in this section, how would this change affect your fishing activity on **this section** of the St. Joe River.(Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this section	1	0.5	0	0	1	0.5	3	1.4
___ I would decrease my fishing activity	1	0.5	1	0.5	14	6.5	13	6.0
___ My fishing activity would remain the same	5	2.3	10	4.6	42	19.4	79	36.4
___ I would increase my fishing activity	0	0	1	0.5	5	2.3	32	14.8
___ I would begin fishing	0	0	1	0.5	1	0.5	7	3.2

7. Due to the cost of raising hatchery trout ($.60 each to rear and stock), the Department tries to stock trout onl where at least 40% of the fish stocked are caught (this costs $1.50 per fish caught). I would support eliminating stocking in the St. Joe River where less than 40% of the fish stocked were caught.

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Yes	3	1.4	6	2.8	33	15.5	94	44.1
___ No	4	1.9	6	2.8	29	13.6	38	17.8

8. I would support the elimination of stocking hatchery trout in the section of St. Joe River between the old railroad bridge at Fall Creek and Prospector Creek, if ponds were constructed along the river and stocke with hatchery trout I could keep.

Section 1 Section 2 Section 3 Section 4

Appendix B. Continued.

	No.	%	No.	%	No.	%	No.	%
___ Yes	4	1.9	5	2.4	46	7.7	53	25.4
___ No	3	1.4	7	3.4	45	21.5	76	36.4

SECTION 4. This section pertains **only to the tributaries** of the St. Joe River from ***old railroad bridge at Fall Cree to Prospector Creek.***

1. Do you fish in the tributaries to the St. Joe River between old railroad bridge at Fall Creek and Prospector Cr.?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Yes	5	2.3	5	2.3	42	19.4	31	14.4
___ No	2	0.9	8	3.7	20	9.3	103	47.7

2. In the last 12 months, how many days have you fished in the tributaries to the St. Joe River between ol railroad bridge at Fall Creek and Prospector Creek? (Please check one)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ 1-5	4	1.9	5	2.4	26	12.2	33	15.5
___ 6-10	1	0.5	1	0.5	7	3.3	1	0.5
___ 11-15	0	0	0	0	3	1.4	0	0
___ 16-20	1	0.5	0	0	1	0.5	0	0
___ 21-25	0	0	0	0	1	0.5	0	0
___ >25	0	0	0	0	2	0.9	1	0.5
___ none	0	0	0	0	0	0	0	0

3. In general, I feel that fishing regulations on the tributaries in **this section** of the St. Joe. River allow me to keep enough fish (current limit for trout is six fish). (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Strongly disagree	0	0	0	0	3	1.4	5	2.4
___ Disagree	1	0.5	2	1.0	2	1.0	2	1.0
___ Neutral	1	0.5	2	1.0	20	9.6	57	27.4
___ Agree	4	1.9	7	3.4	29	13.9	32	15.4
___ Strongly agree	1	0.5	2	1.0	8	3.9	30	14.4

4. If the bag limit was reduced on the tributaries, how would this change affect your fishing activity in these streams? (Please select the one that best describes your feelings)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ I would stop fishing this section	2	1.0	1	0.5	1	0.5	2	1.0
___ I would decrease my fishing activity	1	0.5	1	0.5	10	4.8	1	0.5
___ My fishing activity								

Appendix B. Continued.

would remain the same	4	1.9	9	4.3	38	18.3	82	39.4
___ I would increase my fishing activity	0	0	0	0	11	5.3	29	13.9
___ I would begin fishing	0	0	2	1.0	1	0.5	13	6.3

5. It is important to me to have uniform regulations on the tributaries and the mainstem knowing that harvest may be reduced.

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	3	1.3	1	0.5	2	0.9	1	0.5
Section 2	0	0	3	1.3	2	0.9	7	3.1	1	0.5
Section 3	6	2.7	8	3.6	13	5.8	22	9.8	12	5.4
Section 4	10	4.5	19	8.5	40	17.9	34	15.2	29	13.0

6. It is important to me to have the opportunity to harvest a limit of fish in the tributaries knowing that fishing regulations would be more complicated.

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	0	0	2	0.9	4	1.8	1	0.5
Section 2	3	1.3	3	1.3	2	0.9	4	1.8	0	0
Section 3	11	4.9	16	7.1	21	9.4	7	3.1	5	2.2
Section 4	55	24.6	29	13.0	36	16.1	10	4.5	2	0.9

SECTION 5. These questions pertain to **guided fishing trips** on the St. Joe River. (Please circle the numbe that best describes your feelings).

1. Commercially **guided walk and wade** fishing trips are appropriate on the St. Joe River.

	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	4	1.8	2	0.9	0	0	1	0.5	0	0
Section 2	4	1.8	5	2.3	3	1.4	1	0.5	0	0
Section 3	19	8.7	16	7.3	17	7.8	8	3.7	1	0.5
Section 4	43	19.6	17	7.8	34	15.5	34	15.5	10	4.6

Appendix B. Continued.

2. Commercially **guided float boat** fishing trips are appropriate on the St. Joe River.

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	6	2.7	1	0.5	0	0	0	0	0	0
Section 2	5	2.3	5	2.3	3	1.4	0	0	0	0
Section 3	26	11.9	15	6.9	10	4.6	8	3.7	2	0.9
Section 4	60	27.4	23	10.5	32	14.6	20	9.1	3	1.4

3. The number of guided fishing trips on the St. Joe River is

	too low		just right		too high		don't know	
	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	1	0.5	4	1.9	2	1.0
Section 2	0	0	0	0	4	1.9	9	4.3
Section 3	1	0.5	3	1.4	17	8.1	37	17.5
Section 4	2	1.0	15	7.1	35	16.6	81	38.4

SECTION 6. The following questions pertain to your overall knowledge of the Department of Fish and Game.

1. How well does the Department manage the supply of game fish for fishing in the St. Joe River?

	Poor		Fair		Good		Excellent		Don't know	
	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	4	1.8	2	0.9	0	0	1	0.5
Section 2	2	0.9	5	2.2	4	1.8	0	0	2	0.9
Section 3	4	1.8	6	2.7	26	11.7	13	5.8	14	6.3
Section 4	2 0.9	8	3.6	67	30.0	24	10.8	39	17.5	

2. How well does the Department manage and protect the fish resources in the St Joe River?

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	2	0.9	1	0.5	3	1.4	0	0	1	0.5
Section 2	5	2.2	1	0.5	2	0.9	1	0.5	4	1.8
Section 3	7	3.1	6	2.7	27	12.1	10	4.5	13	5.8
Section 4	6	2.7	21	9.4	57	25.6	27	12.1	29	13.0

3. How well does the Department

Appendix B. Continued.

manage and protect fish habitat in the St. Joe River?

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	3	1.4	3	1.4	0	0	1	0.5
Section 2	3	1.4	2	0.9	3	1.4	1	0.5	4	1.8
Section 3	3	1.4	9	4.0	20	9.0	18	8.1	13	5.8
Section 4	6	2.7	14	6.3	51	22.9	34	15.3	35	15.7

4. How well has the Department incorporated sportsmen's wants and needs into management of the St. Joe River?

	No.	%	No.	%	No.	%	No.	%	No.	%
Section 1	0	0	5	2.2	0	0	1	0.5	1	0.5
Section 2	3	1.4	4	1.8	2	0.9	0	0	4	1.8
Section 3	3	1.4	11	4.9	24	10.8	11	4.9	14	6.3
Section 4	3	1.4	13	5.8	55	24.7	20	9.0	49	22.0

SECTION 7. The following questions are optional, but will help us better understand the anglers who fish the St. Joe River drainage.

1. What is your gender?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___Male	7	3.1	12	5.4	54	24.2	129	57.9
___Female	0	0	1	0.5	8	3.6	12	5.4

2. What is your marital status?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
____ Single	2	0.9	3	1.4	19	8.5	47	21.1
___ Married	5	2.2	10	4.5	43	19.3	94	42.2

3. Do you have any children living at home?

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ Yes	1	0.5	6	2.7	30	13.5	49	22.0
___No	6	2.7	7	3.1	32	14.4	92	41.3

4. Please select the response that best describes the area where you live. (Please check one)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
___ rural area	3	1.4	3	1.4	20	9.0	19	8.6
___ suburb	3	1.4	6	2.7	10	4.5	25	11.3
___ small town (less than 4,999)	0	0	1	0.5	10	4.5	33	14.9
___ small city (5,000 to 49,999)	1	0.5	0	0	2	0.9	6	2.7
___ large city (50,000 to 500,000)	0	0	3	1.4	18	8.1	48	21.6

Appendix B. Continued.

___ very large city (over 500,000)	0	0	0	0	1	0.5	10	4.5

5. What is the highest level of education you have completed? (Please check one)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
some high school	2	0.9	2	0.9	7	3.1	8	3.6
high school graduate	1	0.5	3	1.4	10	4.5	7	3.1
trade or technical school	0	0	2	0.9	6	2.7	9	4.0
some college	3	1.4	4	1.8	21	9.4	28	12.6
college graduate	0	0	0	0	10	4.5	49	22.0
graduate or professional degree 1	0.5	2	0.9	8	3.6	40	17.9	

6. Which category best describes your occupation. (Please check one)

	Section 1		Section 2		Section 3		Section 4	
	No.	%	No.	%	No.	%	No.	%
professional/technical	1	0.5	1	0.5	13	5.8	58	26.0
skilled worker	2	0.9	3	1.4	12	5.4	14	6.3
skilled worker/operator	2	0.9	1	0.5	9	4.0	8	3.6
unskilled laborer	0	0	0	0	0	0	1	0.5
clerical/sales	0	0	1	0.5	1	0.5	4	1.8
logger	0	0	2	0.9	1	0.5	1	0.5
miner	0	0	0	0	0	0	0	0
service worker	0	0	0	0	1	0.5	4	1.8
farmer	0	0	0	0	1	0.5	0	0
student	0	0	2	0.9	7	3.1	11	4.9
retired	2	0.9	2	0.9	5	2.2	15	6.7
housewife	0	0	0	0	2	0.9	1	0.5
self-employed	0	0	1	0.5	5	2.2	16	7.2
other	0	0	0	0	0	0	0	0

7. Please give your age. _________ Years

	Section 1	Section 2	Section 3	Section 4
N	7	21	67	141
Minimum	35	16	0	0
Maximum	80	70	76	79
Median	51	46	38	42
Mean	53	45.5	38.6	42.2
Std. error	6.5	3.4	1.7	1.2

Thank you for your time and assistance in completing this questionnaire. Your assistance will help expand our understanding of the men and women involved with the fishing in the Spokane drainage.

Appendix C. Summary of angler opinion survey for the North Fork Coeur d'Alene River, Idaho, 1996

SPOKANE RIVER DRAINAGE ANGLER SURVEY

SECTION 1. These questions pertain to the **North Fork Coeur d'Alene River only.**

1. How many years have you fished the North Fork Coeur d'Alene River at least once?

N of cases	116
Minimum	0.0
Maximum	70.000
Median	5.000
Std. Error	1.098

2. How many days in the past 5 years have you fished the North Fork Coeur d'Alene River? (Please check one)

31-26.7% 1-5
16-13.8% 6-10
13-11.2% 11-15
8-6.9% 16-20
9-7.85 21-25
38-33.6% more than 25
________ none
Total 116

3. How many days have you fished the North Fork Coeur d'Alene River in the last 12 months? ___days

N of cases	114
Minimum	1.000
Maximum	90.000
Median	5.000
Mean	10.605
Std. Error	1.365

4. Do you fish on the North Fork Coeur d'Alene River (less often___, same___, more often___) now as you did in previous years?

Count	Cum Count	Pct	Cum Pct	
34.	34.	31.8	31.8	Less
28.	62.	26.2	57.9	More
45.	107.	42.1	100.0	Same

5. What type (s) of tackle do you fish with **most often** on the North Fork Coeur d'Alene

Appendix C. Continued.

River? (Please check one).

Count	Count	Pct	Pct	
25.	25.	23.8	23.8	Bait
65.	90.	61.9	85.7	Flies
15.	105.	14.3	100.0	Lures

6. Which section of the Nrth Fork Coeur d'Alene River do you most **prefer** to fish? (Please check one).

Count	Cum Count	Pct	
40.	40.	34.8	Yellowdog Cr. downstream
33.	73.	28.7	Yellowdog Cr. upstream.
10.	83.	8.7	Tributaries N. F. Coeur d'Alene River below Yellowdog Creek
32.	115.	27.8	No preference

Why do you prefer to fish in this section? (Please select all that apply) N=110

46 number of fish caught
35 type of fish
36 distance from home
48 type of water
24 closeness to a road
20 closeness to a campground
34 other (please specify)__________________.
45 size of fish
40 fewer of people
29 type of fishing regulations
6 access
12 lack of a road
14 area is stocked with hatchery trout

7. Some anglers may **prefer** to fish one area but **actually fish** in another. In the last five years, which section of the North Fork Coeur d'Alene River did you **most often** fish? (Please check one)

Count	Cum Count	Pct	
53.	53.	47.7	Yellowdog Cr. downstream
29.	82.	26.	Yellowdog Cr. upstream
13.	95.	11.7	Tributaries to the N.F. Coeur d'Alene River below Yellowdog Creek
16.	111.	14.4	All equally

Why did you actually fish this section most often? (Please select all that apply)

41 number of fish caught
33 type of fish
39 distance from home
44 type of water
26 closeness to a road
20 closeness to a campground
26 other (please specify)__________________.
31 size of fish
40 fewer of people
21 type of fishing regulations
4 access
8 lack of a road
7 area is stocked with hatchery trout

Appendix C. Continued.

Please circle the number that best describes your feelings.

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
8.	I feel that fishing regulations for the North Fork Coeur d'Alene River are difficult to understand.	21 18.3%	58 50.4%	12 10.4%	17 14.8%	7 6.1%
9.	The current fishing regulations on the North Fork Coeur d'Alene River are easy to follow.	9 7.8%	15 13.0%	10 8.7%	66 57.4%	15 13.0%

10. Are you familiar with the Fish and Game special brochure on fishing in the Spokane River drainage

19.8% Yes

80.2% No

If yes, Please rate the usefulness of this brochure to you in understanding the fishing regulations on the North Fork Coeur d'Alene River?

3.7% Poor 29.6% Fair 44.4% Good 22.2% Excellent n=27

Please circle the number that best describes your feelings.

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
11.	I feel it is important to allow catch-and-release fishing on a portion of the North Fork Coeur d'Alene River.	5 4.3%	7 6.1%	12 10.4%	33 28.7%	58 50.4%
12.	I would support expanding the catch-and-release section of the North Fork Coeur d'Alene River knowing that the harvest section would be smaller.	17 14.7%	22 20.0%	21 18.1%	20 17.2%	36 31.0%
13.	I think it is important to allow harvest fishing on a portion of the North Fork Coeur d'Alene River.	11 9.5%	8 6.9%	16 13.8%	55 47.4%	26 22.4%
14.	I would support expanding the harvest section of the North Fork Coeur d'Alene River knowing that the catch-and-release	36 31.0%	36 31.0%	18 15.6%	23 19.8%	3 2.6%

section would have to become smaller.

15.	I would prefer regulations which would result in me catching more fish, even if it meant I could keep fewer fish to take home.	7 6.0%	16 13.8%	24 20.7%	36 31.0%	33 28.4%
16.	I would prefer regulations which allow me to keep more fish now knowing it would result in fewer fish to catch on future trips.	54 47.0%	37 32.2%	15 13.0%	7 6.1%	2 1.7%

SECTION 2. These questions pertain to your feelings in general about trout fishing. Please circle the number that best describes your feelings.

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	I enjoy eating the trout I catch.	16 13.8%	15 12.9%	5 4.3%	44 37.9%	36 31.0%
2.	I would rather catch one trophy trout than my limit of average size trout.	10 8.6%	42 36.2%	9 7.8%	25 21.56%	30 25.8%
3.	I often share my trout catch wih others.	29 25.2%	40 34.8%	3 2.6%	33 28.7%	10 8.7%
4.	I consider my fishing trip to be worthwhile, only if I catch trout.	18 15.5%	50 43.1%	6 5.2%	24 20.7%	18 15.5%
5.	I release most of the trout I catch.	3 2.6%	15 12.9%	4 3.4%	56 48.3%	38 32.8%
6.	I release all the trout I catch.	17 14.8%	60 52.1%	8 7.0%	3 2.6%	27 23.5%
7.	Catching a limit of trout is important to me.	36 31.6%	53 46.5%	8 7.0%	15 13.2%	2 1.7%
8.	I enjoy catching more trout than my friends.	19 15.5%	44 38.3%	13 11.3%	22 19.1%	17 14.8%

Appendix C. Continued.

9.	I often keep all the trout I catch	35	51	2	26	3
	up to the legal limit.	30.2%	44.0%	1.7%	22.4%	1.7%
10.	I feel stocked trout are as enjoyable	13	34	22	36	11
	to catch as wild trout.	11.2%	29.3%	18.9%	31.0%	9.5%
11.	Fishing in stocked waters gives	4	13	15	65	19
	me a greater chance of catching trout.	3.4%	11.2%	12.9%	56.0%	16.4%
12.	I try to fish streams shortly after they	28	60	17	9	
tocked	with trout 52.2%	14.8%	7.8%	0.8%		
13.	Stocking is important to maintain good	9 12	31	45		19
	trout fishing.	7.7	10.3	26.7	38.8	16.4

14. How would you compare the number of trout you catch to that of other anglers? (Please check one)
    Count-percent
    5 - 4.4% much less
    24 - 21.2% less
    41 - 36.3% same
    36 - 31.8% more
    7 - 6.2% much more

15. Do you belong to a local sportsman club (ie. rod and gun club or fishing club)
    8 - 6.9% Yes (please list)
    ___Shoshone County Sportsman Assoc.
    ___St. Maries Sportsman Assoc
    3 North Idaho Fly Casters
    ______________(others)
    108 - 93.1% No

16. Do you belong to a National sportsman group?
    11 - 9.5% Yes (Please list)
    2 Trout Unlimited (Chapter__________)
    2 Federation of Fly Fishers
    2 Other (please specify) ______________
    105 - 90.5% No

17. What sporting magazines or newspapers do you receive? (Please select all that apply)
    5 Trout
    7 Hunting and Fishing News
    2 In Fisherman
    31 Sports Afield
    25 Idaho Wildlife
    23 Outdoor Life
    16 Field and Stream
    49 Fly Fisherman

Appendix C. Continued.

14 Others (please list) ________________, ____________________, _____________
3 None

18. Where do you receive your information on Idaho's fish and wildlife resources? (Please check all th apply)
49 Newspapers
6 Radio
15 Television
76 Regulations brochures
27 Brochures/pamphlets
56 Local sporting goods store
65 Family and friends
18 Department publications (Idaho Wildlife Magazine, Fish and Game News)
1 Do not know
6 Have not received information
10 other (please specify ____)

SECTION 3. These questions pertain to the section of the North Fork Coeur d'Alene River ***downstream of Yellowdog Creek.*** Please answer the following questions ***even if you do no fish*** the section from Yellowdog Creek downstream.

1. Do you fish the section of the North Fork Coeur d'Alene River **downstream from Yellowdog Creek**?
91 - 79% Yes
19 - 15.7% No
6 - 5.2% Don't know

2. In general, I feel fishing regulations for **this section** of the North Fork Coeur d'Alene River allow me to keep enough fish. (Please select the one that best describes your feelings)
9 - 7.9% Strongly disagree
18 - 15.7% Disagree
19 - 16.7% Neutral
50 - 43.9% Agree
18 - 15.7% Strongly agree

3. If the number of hatchery trout stocked **in this section** was **decreased,** my fishing effort **on the thi section** of the river would (Please select the one that best describes your feelings)
4 - 3.5% I would stop fishing this portion entirely
13 - 11.5% Decrease considerably
23 - 20.3% Decrease some
67 - 59.3% Stay the same
5 - 4.4% Increase some
1 - 0.9% Increase considerably

Appendix C. Continued.

4. If hatchery stocking were stopped in this section, how would this change affect your fishing activity on **this section** of the North Fork Coeur d'Alene River. (Please select the one that best describes your feelings)
 7 - 6.1% I would stop fishing this section
 23 - 20.3% I would decrease my fishing activity
 74 - 64.9% My fishing activity would remain the same
 8 - 7.0% I would increase my fishing activity
 2 - 1.8% I would begin fishing

5. Due to the cost of raising hatchery trout ($.60 each to rear and stock), the Department tries to stock trout only where at least 40% of the fish stocked are caught (this costs $1.50 per fish caught). I would support eliminating stocking in the North Fork Coeur d'Alene River where less than 40% of the fish stocked were caught.
 52 - 46% Yes
 61 - 77.5% No

6. I would support the elimination of stocking hatchery trout in the section of North Fork Coeur d'Alene River ***from Yellowdog Creek downstream***, if ponds were constructed along the river and stocked with hatchery trout I could keep.
 25 - 22.5% Yes
 86 - 77.5% No

7. If opportunity to keep fish was eliminated on the section of the North Fork Coeur d'Alene River ***from Yellowdog Creek downstream to Lost Creek***, how would this change affect your fishing activity in this section? (Please select the one that best describes your feelings)
 7 - 6.1% I would begin fishing in this section in this section
 17 - 14.9% I would increase my fishing activity in this section
 47 - 41.2% My fishing activity would remain the same in this section
 20 - 17.5% I would decrease my fishing activity in this section
 23 - 20.2% I would stop fishing this section

8. If it were unlawful to use bait in the North Fork Coeur d'Alene River ***from Yellowdog Creek downstream to Lost Creek***, my fishing effort **on this section** would (Please select the one that best describes your feelings)
 10 - 8.8% I would stop fishing this portion entirely
 14 - 12.3% Decrease considerably
 16 - 14.0% Decrease some
 48 - 42.1% Not change
 13 - 11.4% Increase some
 13 - 11.4% Increase considerably

SECTION 4. This section pertains **only to the tributaries** of the North Fork Coeur d'Alene River

Appendix C. Continued.

from ***Yellowdog Creek downstream.***

1. Do you fish in the tributaries to the North Fork Coeur d'Alene River downstream of Yellowdog Creek?
   54 - 47% Yes
   61 - 53% No

2. In the last 12 months, how many days have you fished in the tributaries to the North Fork Coeur d'Alene River downstream of Yellowdog Creek? (Please check one)
   36 - 32.4% 1-5
   11 - 9.9% 6-10
   5 - 4.5% 11-15
   2 - 1.8% 16-20
   1 - 0.9% 21-25
   3 - 2.7% more than 25
   53 - 47.7% none

3. In general, I feel that fishing regulations on the tributaries in **this section** of the North Fork Coeur d'Alene River allow me to keep enough fish (current limit for trout is six fish). (Please select the one that best describes your feelings)
   5 - 4.6% Strongly disagree
   2 - 1.8% Disagree
   36 - 33.0% Neutral
   46 - 42.2% Agree
   20 - 18.3% Strongly agree

4. If the bag limit was reduced on the tributaries, how would this change affect your fishing activity in these streams? (Please select the one that best describes your feelings)
   6 - 5.6% I would stop fishing this section
   11 - 10.2% I would decrease my fishing activity
   80 - 74.0% My fishing activity would remain the same
   5 - 4.6% I would increase my fishing activity
   6 - 5.6% I would begin fishing

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5. It is important to me to have uniform regulations on the tributaries and the mainstem knowing that harvest may be reduced.	4 3.7%	14 13.1%	31 29.0%	42 39.2%	16 15.0%

6. It is important to me to have the

opportunity to harvest a limit of fish in the tributaries knowing that fishing regulations would be more complicated.	21 19.8%	39 36.8%	26 24.5%	16 15.1%	4 3.8%

SECTION 5. These questions pertain to **guided fishing trips** on the North Fork Coeur d'Alene River. (Please circle the number that best describes your feelings).

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Commercially **guided walk and wade** fishing trips are appropriate on the North Fork Coeur d'Alene River.	39 36.1%	26 25.9%	23 19.4%	15 13.9%	5 4.6%
2.	Commercially **guided float boat** fishing trips are appropriate on the North Fork Coeur d'Alene River.	46 42.6%	28 25.9%	21 19.4%	10 9.3%	3 2.8%

3. The number of guided fishing trips on the North Fork Coeur d'Alene River is

too low	4 - 3.6%
just right	9 - 8.2%
too high	17 - 15.5%
don't know	80 - 73.7%

SECTION 6. The following questions pertain to your overall knowledge of the Department of Fish and Game.

		Poor	Fair	Good	Excellent	Don't know	
1.	How well does the Department manage the supply of game fish for fishing in the North Fork Coeur d'Alene River?	4 3.4%	28 24.3%	37 32.2%	10 8.7%	36 31.3%	
2.	How well does the Department manage and protect the fish resources in the North Fork Coeur d'Alene River?	9	15 7.9%	42 13.2%	20 36.8%	28 17.5%	24.6%
3.	How well does the Department manage and protect fish habitat in the North Fork Coeur d'Alene River?	12	19 10.5%	40 16.7%	15 35.1%	28 13.1%	24.6%

4. How well has the Department incorporated sportsmen's wants and needs into management of the North Fork Coeur d'Alene River?	10	22	33	15	35
	8.7%	19.1%	28.7%	13.0%	30.4%

SECTION 7. The following questions are optional, but will help us better understand the anglers who fish the North Fork Coeur d'Alene River drainage.

1. What is your gender? 107 - 93.9% Male   7 - 6.1% Female

2. What is your marital status?
   33 - 29.9% Single
   81 - 71.1% Married

3. Do you have any children living at home?
   44 - 38.6% Yes
   70 - 61.4% No

4. Please select the response that best describes the area where you live. (Please check one)
   13 - 11.4% rural area
   7 - 6.1% suburb
   31 - 27.2% small town (less than 4,999)
   53 - 37.7% small city (5,000 to 49,999)
   18 - 15.8% large city (50,000 to 500,000)
   2 - 1.8% very large city (over 500,000)

5. What is the highest level of education you have completed? (Please check one)
   5 - 4.4% some high school
   42 - 36.8% some college
   13 - 11.4% high school graduate
   23 - 20.2% college graduate
   14 - 12.3% trade or technical school
   17 - 14.9% graduate or professional degree

6. Which category best describes your occupation. (Please check one)
   26 - 22.8% professional/technical (doctor, lawyer etc)
   30 - 26.3% skilled worker
   15 - 13.1% skilled worker/operator
   2 - 1.8% unskilled laborer
   3 - 2.6% clerical/sales
   1 - 0.9% logger
   0 miner
   1 - 0.9% service worker
   0 farmer
   1 - 0.9% student
   13 - 11.4% retired
   0 housewife
   12 - 10.5% self-employed business
   10 - 8.8% other

7. Please give your age. (Years)
   N 113 Minimum 18

Appendix C. Continued.

Maximum	80	Median	40.0
Mean	41.6	Std. Error	1.4

Appendix D. Summary of angler opinion survey for the St. Joe River, Idaho, 1996.

SPOKANE RIVER DRAINAGE ANGLER SURVEY

SECTION 1. These questions pertain to the **ST. JOE RIVER only.**

1. How many years have you fished the St. Joe River at least once?_______years

N of cases	224	Mean	10.397
Minimum	0.0	SEM	0.806
Maximum	66.000	Median	6.0

2. How many days in the past 5 years have you fished the St. Joe River? (Please check one)
53 - 23.9% 1-5
33 - 14.9% 6-10
22 - 9.9% 11-15
16 - 7.2% 16-20
13 - 5.9% 21-25
85 - 38.3% more than 25
___ none

3. How many days have you fished the St. Joe River in the last 12 months? _____days

N of cases	223	Median	5
Minimum	1.000	Mean	8.444
Maximum	60.000	SEM	0.569

4. Do you fish on the St. Joe River (less often___, same___, more often___) now as you did in previoı years?
Less 38 - 18.1%
Same 97 - 46.2%
More 75 - 35.7%

5. What type (s) of tackle do you fish with **most often** on the St. Joe River? (Please check one)
22 - 10.3% bait
24 - 11.2% lures
168 - 78.5% flies

6. Which section of the St. Joe River do you most **prefer** to fish? (Please check one)
40 - 19.4% Prospector Cr. downstream
91 - 44.2% Prospector Cr. up to SpruceTree CG
31 - 15.0% SpruceTree CG upstream
33 - 16.0% No preference
5 - 2.4% Marble Cr.
4 - 1.9% North Fork St. Joe
2 - 1.0% other tributaries

Appendix D. Continued.

Why do you prefer to fish in this section? (Please select all that apply)

117 number of fish caught	77 size of fish
71 type of fish	87 fewer of people
23 distance from home	41 type of fishing regulations
109 type of water	27 access
30 closeness to a road	9 lack of a road
42 closeness to a campground	21 area is stocked with hatchery trout
81 other (please specify)______________.	

7. Some anglers may **prefer** to fish one area but **actually fish** in another. In the last five years, which section of the St. Joe River did you **most often** fish? (Please check one)

52 - 25.2% Prospector Cr. downstream	6 - 2.9% Marble Cr.
104 - 50.4% Prospector Cr. up to SpruceTree CG	8 - 3.9% North Fork St. Joe
19 - 9.2% SpruceTree CG upstream	2 - 0.9% other tributaries
15 - 7.3% all equally	

Why did you actually fish this section most often? (Please select all that apply)

101 number of fish caught	61 size of fish
52 type of fish	71 fewer of people
28 distance from home	44 type of fishing regulations
92 type of water	13 access
36 closeness to a road	7 lack of a road
44 closeness to a campground	25 area is stocked with hatchery trout
66 other (please specify)______________.	

Please circle the number that best describes your feelings.

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
8.	I feel that fishing regulations for the St. Joe River are difficult to understand.	74 33.3%	112 50.5%	11 4.9%	19 8.6%	6 2.7%
9.	The current fishing regulations on the St. Joe River are easy to follow.	11 5.0%	16 7.2%	12 5.4%	124 56.1%	58 26.2%

10. Are you familiar with the Fish and Game special brochure on fishing in the Spokane River drainage'

37 -16.6% Yes

186 - 83.4% No

If yes, Please rate the usefulness of this brochure to you in understanding the fishing regulations on the St. Joe River? 1 Poor 5 Fair 26 Good 5 Excellent

Appendix D. Continued.

Please circle the number that best describes your feelings.

		Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
11.	I feel it is important to allow catch-and-release fishing on a portion of the St. Joe River.	5 2.2%	2 0.9%	7 3.1%	44 19.7%	165 74.0%
12.	I would support expanding the catch-and-release section of the St. Joe River knowing that the harvest section would be smaller.	25 11.2%	25 11.2%	22 9.8%	34 15.2%	118 52.7%
13.	I think it is important to allow harvest fishing on a portion of the St. Joe River.	33 14.8%	26 11.7%	29 13.1%	96 43.2%	38 17.1%
14.	I would support expanding the harvest section of the St. Joe River knowing that the catch-and-release section would have to become smaller.	135 60.5%	55 24.7%	13 5.8%	10 4.5%	10 4.5%
15.	I would prefer regulations which would result in me catching more fish, even if it meant I could keep fewer fish to take home.	12 5.4%	26 11.8%	19 8.6%	53 24.0%	111 50.2%
16.	I would prefer regulations which allow me to keep more fish now knowing it would result in fewer fish to catch on future trips.	153 68.9%	51 23.0%	9 4.1%	5 2.2%	4 1.8%

SECTION 2. These questions pertain to your feelings in general about trout fishing. Please circle the number that best describes your feelings.

		Strongly Disagree	Disagree	Undecided	Agree	Strongl[illegible] Agre[illegible]
1.	I enjoy eating the trout I catch.	40 18.4%	55 25.2%	13 6.0%	81 37.1%	29 13.3[illegible]
2.	I would rather catch one trophy trout than my limit of average size trout.	16 7.2%	45 20.3%	35 15.8%	74 33.4%	51 23.1[illegible]

Appendix D. Continued.

3.	I often share my trout catch with others.	91 41.6%	65 29.7%	22 10.1%	32 16.6%	9 4.1%
4.	I consider my fishing trip to be worthwhile, only if I catch trout.	50 22.6%	67 30.3%	22 10.0%	50 22.6%	32 14.5%
5.	I release most of the trout I catch.	10 4.6%	13 6.0%	3 1.3%	64 29.6%	126 58.3%
6.	I release all the trout I catch.	12 5.4%	57 25.8%	7 3.1%	35 15.8%	110 49.8%
7.	Catching a limit of trout is important to me.	94 42.7%	80 36.3%	20 9.1%	21 9.6%	5 2.3%
8.	I enjoy catching more trout than my friends.	36 16.5%	50 22.9%	37 17.0%	62 28.4%	33 15.1%
9.	I often keep all the trout I catch up to the legal limit.	135 60.5%	57 25.6%	5 2.2%	23 10.3%	3 1.4%
10.	I feel stocked trout are as enjoyable to catch as wild trout.	65 29.0%	54 24.1%	36 16.1%	47 21.0%	22 9.8%
11.	Fishing in stocked waters gives me a greater chance of catching trout.	28 12.6%	31 13.9%	53 23.8%	86 38.6%	25 11.2%
12.	I try to fish streams shortly after they are stocked with trout.	87 39.0%	87 39.0%	38 17.0%	10 4.5%	1 0.5%
13.	Stocking is important to maintain good trout fishing.	50 22.4%	22 9.9%	62 27.8%	65 29.1%	24 10.8%

14. How would you compare the number of trout you catch to that of other anglers? (Please check one)
7 - 3.1% much less
25 - 11.3%less
76 - 34.4%same

Appendix D. Continued.

86 - 38.9% more
27 - 12.2% much more

15. Do you belong to a local sportsman club (ie. rod and gun club or fishing club)
22 - 9.9 Yes (please list) ___Shoshone County Sportsman Assoc.
___St. Maries Sportsman Assoc
3___North Idaho Fly Casters
_____________________(others)
200 - 90.1% No

16. Do you belong to a National sportsman group?
38 - 17% Yes (Please list) 3___ Trout Unlimited (Chapter__________)
2___ Federation of Fly Fishers
___ Other (please specify) ______________________
____
____
186 - 83% No

17. What sporting magazines or newspapers do you receive? (Please select all that apply)
17 Trout 12 Outdoor Life 16 Sports Afield 37 Field and Stream
10 Hunting and Fishing News 35 Idaho Wildlife 93 Fly Fisherman
6 In Fisherman
33 Others (please list) ______________, ________________, ___________
12 None

18. Where do you receive your information on Idaho's fish and wildlife resources? (Please checkall th apply)
93 Newspapers
21 Radio
21 Television
132 Regulations brochures
62 Brochures/pamphlets
104 Local sporting goods store
136 Family and friends
59 Department publications (Idaho Wildlife Magazine, Fish and Game News)
3 Do not know
7 Have not received information
16 other (please specify ____________________________________)

SECTION 3. These questions pertain to the section of the St. Joe River ***downstream of Prospector Creek.*** Please answer the following questions ***<u>even if you do not fish</u>*** the section from Prospector Creek downstream.

1. Do you fish the section of the St. Joe River from old railroad bridge at Fall Creek upstream to

Prospector Creek?
121 - 54.6% Yes
75 - 33.4% No
26 - 11.7% Don't know

2. In general, I feel fishing regulations for **this section** of the St. Joe River allow me to keep enough fish. (Please select the one that best describes your feelings)
7 - 3.3% Strongly disagree
17 - 8.0% Disagree
73 - 34.3% Neutral
62 - 29.1% Agree
54 - 25.5% Strongly agree

3. If opportunity to keep fish was eliminated on this section of the St. Joe River **from old railroad bridge at Fall Creek upstream to Prospector Creek**, how would this change affect your fishing activity in this section? (Please select the one that best describes your feelings)
44 - 20.4% I would begin fishing in this section in this section
57 - 26.4% I would increase my fishing activity in this section
75 - 34.7% My fishing activity would remain the same in this section
26 - 12.0% I would decrease my fishing activity in this section
14 - 6.5% I would stop fishing this section

4. If it were unlawful to use bait **in this section** of the St. Joe River, my fishing effort **on this section** would (Please select the one that best describes your feelings)
13 - 6.0% I would stop fishing this portion entirely
13 - 6.5% Decrease considerably
11 - 5.1% Decrease some
83 - 38.4% Not change
45 - 20.8% Increase some
50 - 23.2% Increase considerably

5. If the number of hatchery trout stocked **in this section** was **decreased,** my fishing effort **on the this section** of the river would (Please select the one that best describes your feelings)
3 - 1.4% I would stop fishing this portion entirely
4 - 1.8% Decrease considerably
26 - 11.9% Decrease some
137 - 62.6% Stay the same
28 - 12.8% Increase some
21 - 9.6% Increase considerably

6. If hatchery stocking were stopped in this section, how would this change affect your fishing activity on **this section** of the St. Joe River. (Please select the one that best describes your feelings)
5 - 2.3% I would stop fishing this section

Appendix D. Continued.

29 - 13.4% I would decrease my fishing activity
136 - 62.7% My fishing activity would remain the same
38 - 17.5% I would increase my fishing activity
9 - 4.5% I would begin fishing

7. Due to the cost of raising hatchery trout ($.60 each to rear and stock), the Department tries to stock trout only where at least 40% of the fish stocked are caught (this costs $1.50 per fish caught). I would support eliminating stocking in the St. Joe River where less than 40% of the fish stocked we caught.
136 - 63.9% Yes
77 - 36.1% No

8. I would support the elimination of stocking hatchery trout in the section of St. Joe River between the old railroad bridge at Fall Creek and Prospector Creek, if ponds were constructed along the rive and stocked with hatchery trout I could keep.
78 - 37.3% Yes
131 - 62.7% No

SECTION 4. This section pertains **only to the tributaries** of the St. Joe River from ***old railroad bridge a Fall Creek to Prospector Creek.***

1. Do you fish in the tributaries to the St. Joe River between old railroad bridge at Fall Creek and Prospector Cr.?
83 - 38.4% Yes
133 - 61.6%No

2. In the last 12 months, how many days have you fished in the tributaries to the St. Joe River betwee old railroad bridge at Fall Creek and Prospector Creek? (Please check one)
68 - 31.9% 1-5
10 - 4.7% 6-10
3 - 1.4%11-15
2 - 0.9%16-20
1 - 0.5%21-25
3 - 1.4% more than 25
126 - 59.2% none

3. In general, I feel that fishing regulations on the tributaries in **this section** of the St. Joe. River allow me to keep enough fish (current limit for trout is six fish). (Please select the one that be describes your feelings)
8 - 3.9% Strongly disagree
7 - 3.4% Disagree
80 - 38.5% Neutral
72 - 34.6% Agree
41 - 19.7% Strongly agree

Appendix D. Continued.

4. If the bag limit was reduced on the tributaries, how would this change affect your fishing activity in these streams? (Please select the one that best describes your feelings)
 6 - 2.9% I would stop fishing this section
 13 - 6.3% I would decrease my fishing activity
 133 - 63.9% My fishing activity would remain the same
 40 - 19.2% I would increase my fishing activity
 16 - 7.7% I would begin fishing

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
5.	It is important to me to have uniform regulations on the tributaries and the mainstem knowing that harvest may be reduced.	16 7.5%	33 15.5%	56 26.3%	65 39.5%	43 20.2%
6.	It is important to me to have the opportunity to harvest a limit of fish in the tributaries knowing that fishing regulations would be more complicated.	69 32.7%	48 22.7%	61 28.9%	25 11.8%	8 3.7%

SECTION 5. These questions pertain to **guided fishing trips** on the St. Joe River. (Please circle the number that best describes your feelings).

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Commercially **guided walk and wade** fishing trips are appropriate on the St. Joe River.	70 33.0%	40 18.3%	54 24.7%	44 20.1%	11 5.0%

Appendix D. Continued.

2.	Commercially **guided float boat** fishing trips are appropriate on the St. Joe River.	97 44.3%	44 20.1%	45 20.6%	28 12.8%	5 2.3%

3. The number of guided fishing trips on the St. Joe River is (too low 3- 1.4%, just right 19- 9%, too high 19- 28.4%, don't know 129 - 61.1%).

SECTION 6. The following questions pertain to your overall knowledge of the Department of Fish and Game.

		Poor	Fair	Good	Excellent	Don't know
1.	How well does the Department manage the supply of game fish for fishing in the St. Joe River?	8 3.5%	23 10.3%	99 44.4%	37 16.6%	56 25.1%
2.	How well does the Department manage and protect the fish resources in the St Joe River?	20 9.0%	29 13.0%	89 39.9%	38 17.4%	47 21.1%
3.	How well does the Department manage and protect fish habitat in the St. Joe River?	12 5.4%	28 12.6%	77 34.6%	53 23.8%	53 23.8%
4.	How well has the Department incorporated sportsmen's wants and needs into management of the St. Joe River?	9 4.4%	33 14.8%	81 36.3%	32 14.4%	68 30.5%

SECTION 7. The following questions are optional, but will help us better understand the anglers who fish the St. Joe River drainage.

1. What is your gender? 202 - 90.1% Male 21 - 9.9% Female

2. What is your marital status?
   71 - 31.8% Single
   152 - 68.2% Married

3. Do you have any children living at home?
   86 - 38.6% Yes
   137 - 61.4% No

4. Please select the response that best describes the area where you live. (Please check one)
   45 -20.3% rural area 9- 4.1% suburb

Appendix D. Continued.

44 -19.8% small town (less than 4,999) 69- 31.1% ___ small city (5,000 to 49,999)
44 -19.8% large city (50,000 to 500,000) 11 - 4.9% very large city (over 500,000)

5. What is the highest level of education you have completed? (Please check one)
19 -8.5% some high school 56 - 25.1% some college
21 - 9.4% high school graduate 59 - 26.5% college graduate
17 - 7.6% trade or technical school 51 - 22.9% graduate or professional degree

6. Which category best describes your occupation. (Please check one)
73 - 32.7% professional/technical (doctor, lawyer etc) 5 - 2.2% service worker
31 - 13.9% skilled worker 1 - 0.5% farmer
20 - 9.0% skilled worker/operator 20 - 9.0% student
1 - 0.5% unskilled laborer 24 -10.8% retired
6 - 2.7% clerical/sales 3 - 1.4% housewife
4 - 1.8 logger 22 - 9.9% self-employed business
___ miner 13 - 5.8% other

7. Please give your age. _________ Years

N of cases	222
Minimum	12.000
Maximum	80.000
Median	42.000
Mean	42.005
Std. Error	0.966

Appendix E. Summary of snorkeling observations in transects in the North Fork Coeur d'Alene River, Idaho, August, 1996.

Transect Number	River Section	Length (m)	Width (m)	Area (m2)	Number of Fish Observed: Cutthroat ≤300 (mm)	Cutthroat >300 (mm)	Wild Rainbow ≤300 (mm)	Wild Rainbow >300 (mm)	Hatchery Rainbow	White fish[1]	Other[2]
1	4	54.0	17.2	928.8	1	0	0	0	0	14	0
2	4	75.0	18.6	1395.0	0	0	0	0	0	85	0
3	4	76.0	14.2	1079.2	0	0	0	0	0	100	0
4	4	82.7	23.8	1986.3	0	0	0	0	0	0	0
5	4	130.0	30.0	3912.0	1	0	0	0	0	50	0
6	3	111.0	15.7	1742.7	1	0	0	0	0	7	0
7	3	71.8	8.6	617.5	1	0	0	0	0	97	0
8	3	87.4	14.0	1223.6	3	0	0	0	0	8	0
9	3	65.4	28.5	1863.9	52	5	2	1	0	178	0
10	3	115.0	22.4	2576.0	69	6	14	0	3	115	0
11	2	66.6	29.0	1931.4	0	0	0	0	0	0	0
12	2	120.0	18.9	2268.0	--	--	--	--	--	--	--
13	2	101.8	36.7	3706.7	0	0	0	0	0	0	0
14	2	153.8	28.7	4414.1	4	0	3	0	0	65	0
15	2	108.2	44.6	4825.7	6	1	5	0	0	128	0
16	1	79.0	29.4	2322.6	35	1	10	2	8	55	20
17	1	106.3	30.4	3231.5	10	0	32	2	17	125	60
18	1	110.9	36.1	4003.5	0	0	0	0	0	72	40

Appendix E. Continued.

					Number of Fish Observed						
					Cutthroat		Wild Rainbow		Hatchery Rainbow	White fish[1]	Other[2]
Transect Number	River Section	Length (m)	Width (m)	Area (m2)	≤300 (mm)	>300 (mm)	≤300 (mm)	>300 (mm)			
19	1	110.0	24.4	2884.0	0	0	4	0	0	36	0
20	1	75.0	27.4	2055.0	5	1	6	1	2	84	30
21	1	109.0	21.1	2299.9	8	0	5	0	2	4	0
22	1	90.5	40.4	3656.0	27	5	10	3	7	107	10
23	1	89.0	20.1	1788.9	20	1	32	5	4	750	5
34	5	166.0	19.4	3220.4	4	3	0	0	0	0	1
35	5	60.0	13.6	816.0	9	1	0	0	0	0	0
36	5	37.5	11.6	435.0	1	2	0	0	0	0	0
37	5	52.0	15.9	826.8	30	8	0	0	0	75	0
38	5	89.5	16.5	1476.75	15	6	0	0	0	1	0

[1]Whitefish includes adults and juveniles
[2]Other includes squawfish and suckers

Appendix F. Densities of fish observed while snorkeling in transects in the North Fork Coeur d'Alene River, Idaho, August, 1996.

					Density of Fish Observed					
					Cutthroat		Wild rainbow		Hatchery rainbow	
Transect Number	River Section	Length (m)	Width (m)	Area (m2)	No./m^2	No./100m^2	No./m^2	No./100m^2	No./m^2	No./100m^2
1	4	54	17.2	928.8	0.001	0.1	0	0	0	0
2	4	75	18.6	1395.0	0	0	0	0	0	0
3	4	76	14.2	1079.2	0	0	0	0	0	0
4	4	82.7	23.8	1986.3	0	0	0	0	0	0
5	4	130	30.0	3912.0	0.0003	0.03	0	0	0	0
6	3	111	15.7	1742.7	0.0006	0.06	0	0	0	0
7	3	71.8	8.6	617.5	0.001	0.16	0	0	0	0
8	3	87.4	14.0	1223.6	0.002	0.24	0	0	0	0
9	3	65.4	28.5	1863.9	0.03	3.05	0.16	0.0016	0	0
10	3	115	22.4	2576.0	0.029	2.911	0.0054	0.54	0.001	0.116
11	2	66.6	29.0	1931.4	0	0	0	0	0	0
12	2	120	18.9	2268.0	0	0	0	0	0	0
13	2	101.8	36.7	3706.7	0	0	0	0	0	0
14	2	153.8	28.7	4414.1	0.0009	0.09	0.0006	0.068	0	0
15	2	108.2	44.6	4825.7	0.0014	0.145	0.0002	0.02	0	0
16	1	79	29.4	2322.6	0.0155	1.549	0.005	0.516	0.003	0.344
17	1	106.3	30.4	3231.5	0.003	0.309	0.01	1.01	0.005	0.526
18	1	110.9	36.1	4003.5	0	0	0	0	0	0

Appendix F. Continued.

Transect Number	River Section	Length (m)	Width (m)	Area (m^2)	Density of Fish Observed: Cutthroat No./m^2	Cutthroat No./100m^2	Wild rainbow No./m^2	Wild rainbow No./100m^2	Hatchery rainbow No./m^2	Hatchery rainbow No./100m^2
19	1	110.0	24.4	2684.0	0	0	0.0014	0.149	0	0
20	1	75.0	27.4	2055.0	0.002	0.291	0.003	0.34	0.0009	0.097
21	1	109.0	21.1	2299.9	0.003	0.3	0.002	0.217	0.0008	0.086
22	1	90.5	40.4	3656.0	0.0087	0.875	0.003	0.355	0.001	0.191
23	1	89.0	20.1	1788.9	0.011	1.17	0.006	0.6	0.002	0.223
34	5	166.0	19.4	3220.4	0.002	0.217	0	0	0	0
35	5	60.0	13.6	816.0	0.012	1.220	0	0	0	0
36	5	37.5	11.6	435.0	0.0068	0.689	0	0	0	0
37	5	52.0	15.9	826.8	0.045	4.59	0	0	0	0
38	5	89.5	16.5	1476.8	0.014	1.422	0	0	0	0

Appendix G. Number and estimated densities of fish observed in snorkeling transects in the Little North Fork Coeur d'Alene River, Idaho, August 1996.

New trans. number	Old trans. number	Riv. Sect.	Length (m)	Width (m)	Area (m^2)	Cutthroat		Wild Rainbow		Hatchery rainbow	White fish[1]	Other[2]	Cutthroat		Wild rainbow		Hatchery rainbow	
						<300	>300	≤300	>300				No./m^2	No. /100m^2	No./m^2	No. /100m^2	No./m^2	No. /100m^2
1	33	7	57.0	11.7	666.9	2	0	0	0	0	0	0	0.002	0.299	0	0	0	0
2	32	7	67.3	15.0	1009.50	0	0	0	0	0	50	0	0	0	0	0	0	0
3	31	7	83.8	17.0	1424.6	2	1	1	0	0	19	0	0.002	0.21	0.0007	0.07	0	0
4	30	7	75.5	20.5	1547.8	0	0	0	0	0	0	0	0	0	0	0	0	0
5	29	7	92.7	25.0	2318.3	0	0	0	0	0	70	20	0	0	0	0	0	0
6	28	7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7	27	7	74.9	16.7	1250.8	7	0	0	0	0	20	3	0.005	0.559	0	0	0	0
8	26	7	60.0	24.0	1440.00	0	0	0	0	0	23	0	0	0	0	0	0	0
9	25	8	95.0	16.2	1539.0	11	0	8	0	0	0	0	0.007	0.714	0.005	0.52	0	0
10	24	8	91.4	9.3	850.0	16	0	19	2	3	0	1	0.019	1.88	0.22	2.24	0.003	0.3
11	101	8	27.2	13.5	367.2	6	1	0	0	0	0	0	0.019	1.9	0	0	0	0
12	102	8	51.0	7.5	382.5	0	1	0	0	0	0	0	0.002	0.26	0	0	0	0
13	104	8	63.4	12.0	760.8	0	0	0	0	0	0	0	0	0	0	0	0	0

Appendix H. Summary of snorkeling observations in transects in the St. Joe River, Idaho, August 1996.

Transect Number	River Section	Length (m)	Width (m)	Area (m^2)	Number of fish observed: Cutthroat ≤300 (mm)	Cutthroat >300 (mm)	Bull trout ≤300 (mm)	Bull trout >300 (mm)	Wild rainbow ≤300 (mm)	Wild rainbow >300 (mm)	Hatchery rainbow	Whitefish[1]	Other[2]
1	c&k	85	34.2	2,907	0	0	0	0	0	0	0	0	0
2	c&k	89	30.2	2,688	10	4	0	0	22	0	9	90	60
3	c&k	85	11.8	1,003	13	3	0	0	2	0	0	30	9
4	c&k	68	13.2	898	5	2	0	0	0	0	0	3	0
5	c&k	90	22.0	1,980	4	2	0	0	0	0	0	30	0
6	c&k	155	29.3	4,542	7	0	0	0	5	0	11	15	0
7	c&k	90	28.0	2,520	4	0	0	0	8	1	2	2	0
8	c&r	143	21.2	3,032	33	2	0	0	1	0	1	30	0
9	c&r	125	19.8	2,475	10	4	0	0	4	0	0	15	0
10	c&r	193	17.7	3,416	33	11	0	0	0	0	0	16	1
11	c&r	82	18.8	1,542	3	0	0	0	0	0	0	0	0
12	c&r	55	24.9	1,370	25	7	0	1	3	0	0	15	10
13	c&r	95	29.5	2,803	20	45	0	0	0	0	0	55	35
14	c&r	90	18.2	1,629	100	25	0	0	0	0	0	30	10
15	c&r	79	14.1	1,107	43	10	0	0	1	0	0	4	0
16	c&r	91	14.7	1,330	20	4	1	0	0	0	0	3	0
17	c&r	122	15.0	1,830	37	8	0	0	0	0	0	15	0
18	c&r	96	13.7	1,315	22	10	0	0	0	0	0	0	0
19	c&r	121	17.2	2,081	1	0	0	0	0	0	0	0	10
20	c&r	70	19.2	1,344	34	2	0	0	0	0	0	22	5

Appendix H. Continued.

Transect Number	River Section	Length (m)	Width (m)	Area (m²)	Cutthroat ≤300 (mm)	Cutthroat >300 (mm)	Bull trout ≤300 (mm)	Bull trout >300 (mm)	Wild rainbow ≤300 (mm)	Wild rainbow >300 (mm)	Hatchery rainbow	Whitefish[1]	Other[2]
21	c&r	43	21.2	912	55	10	0	0	0	0	0	75	5
22	c&r	58	22.5	1,305	75	15	0	0	0	0	0	0	0
23	c&r	50	20.8	1000	10	6	0	0	0	0	0	0	0
24	c&r	88	19.0	1,672	20	6	0	0	0	0	0	0	0
25	c&r	71	25.0	1,770	50	15	0	0	0	0	0	50	0
26	c&r	80	20.6	1,648	5	4	0	0	0	0	0	0	0
27	c&r	46	20.1	925	45	25	0	0	1	0	0	70	0
28	c&r	40	12.6	498	6	1	0	0	0	0	0	0	0
29	c&k	180	38.0	6,840	0	0	0	0	0	0	0	10	13
30	c&k	230	40.0	9,200	0	0	0	0	3	0	4	75	220
31	c&k	200	40.0	8,000	6	0	0	0	2	0	1	30	30
32	c&k	64	49.0	3,121	12	1	0	0	41	0	10	40	110
33	c&k	150	47.5	7,125	0	0	0	0	0	0	0	0	0
34	c&k	86	30.0	2,580	15	6	0	0	6	2	0	115	10
35	c&k	75	36.4	2,730	10	4	0	0	8	3	0	80	50

Number of fish observed: columns Cutthroat through Other.

Appendix I. Densities for fish observed while snorkeling in transects in the St. Joe River, Idaho, August, 1996.

Transect Number	Densities of fish observed									
	Cutthroat		Bull trout		Wild rainbow		Hatchery rainbow		Total salmonids	
	No./m²	No./100m²	No./m²	No./100 m²	No./m²	No./100 m²	No./m²	No./1 00m²	No./m²	No./ 100m²
1	0	0	0	0	0	0	0	0	0	0
2	0.005	0.52	0	0	0.008	0.818	0.003	0.334	0.0133	1.34
3	0.015	1.59	0	0	0.001	0.199	0	0	0.017	1.79
4	0.007	0.779	0	0	0	0	0	0	0.007	0.78
5	0.003	0.303	0	0	0	0	0	0	0.003	0.30
6	0.0008	0.088	0	0	0.001	0.11	0.002	0.242	0.001	0.12
7	0.001	0.158	0	0	0.0035	0.357	0.0007	0.079	0.005	0.52
8	0.011	1.15	0	0	0.0003	0.033	0.003	.033	0.011	1.18
9	0.0056	0.565	0	0	0.001	0.161	0	0	0.01	1.01
10	0.01	1.28	0	0	0	0	0	0	0.012	1.28
11	0.001	0.167	0	0	0	0	0	0	0.001	0.17
12	0.02	2.33	0	0	0.002	0.219	0	0	0.026	2.62
13	0.004	0.43	0	0	0	0	0	0	0.004	0.43
14	0.076	7.67	0	0	0	0	0	0	0.076	7.67
15	0.047	4.78	0.0007	0.075	0.0009	0.09	0	0	0.048	4.87
16	0.018	1.87	0	0	0	0	0	0	0.018	1.87
17	0.24	2.45	0	0	0	0	0	0	0.024	2.45
18	0.024	2.43	0	0	0	0	0	0	0.024	2.43
19	0.0004	0.048	0	0	0	0	0	0	0.0004	0.05
20	0.026	2.68	0	0	0	0	0	0	0.026	2.68
21	0.071	7.13	0	0	0	0	0	0	0.071	7.13

Appendix I. Continued.

Transect Number	Densities of fish observed									
	Cutthroat		Bull trout		Wild rainbow		Hatchery rainbow		Total salmonids	
	No./m2	No./100m ^{2}	No./m^2	No./100m^2	No./m^2	No./100m^2	No./m^2	No./100m^2	No./m^2	No./100m^2
22	0.068	6.89	0	0	0	0	0	0	0.068	6.89
23	0.016	1.60	0	0	0	0	0	0	0.016	1.60
24	0.015	1.55	0	0	0	0	0	0	0.015	1.55
25	0.036	3.67	0	0	0	0	0	0	0.036	3.67
26	0.005	0.55	0	0	0	0	0	0	0.005	0.55
27	0.063	6.27	0	0	0	0	0	0	0.063	6.27
28	0.01	1.40	0	0	0	0	0	0	0.014	1.40
29	0	0	0	0	0	0	0.001	0.1	0.001	0.10
30	0	0	0	0	0.0003	0.032	0.0004	0.043	0.000 3	0.39
31	0.0008	0.075	0	0	0.003	0.025	0.0001	0.013	0.001	0.10
32	0.003	0.384	0	0	0.013	1.31	0.003	0.32	0.016	1.69
33	0	0	0	0	0	0	0	0	0	0
34	0.008	0.813	0	0	0	0	0.003	0.31	0.011	1.12
35	0.005	0.512	0	0	0	0	0.004	0.40	0.009	0.92

Appendix J. Bull Trout Redds & Habitat Survey in the Little North Fork of the Clearwater River, Lund, Little Lost Lake, and Lost Lake Creeks, Idaho, 1996

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ABSTRACT

Four tributaries to the Little North Fork of the Clearwater were surveyed including: Lund Creek, Little Lost Lake Creek, Lost Lake Creek and the Little North Fork upstream from its confluence with Little Lost Lake Creek. Ten redds were positively identified in the surveyed area. Many fish were observed, however, only one was positively identifiable as bull trout.

INTRODUCTION

This was a cooperative effort of the Idaho Department of Fish and Game, Panhandle Region, and the United State Department of Interior, Bureau of Land Management. The Task Statement solicits one or two redd surveys for bull trout on each of the following streams: Lund Creek, Little Lost Lake Creek, Lost Lake Creek and the Little North Fork of the Clearwater River (LNFCR), all in the Clearwater River drainage. Stream habitat conditions, migration barriers and survey for adult bull trout as well as redds are included in the task order.

STUDY AREA

The study area is located in the St. Joe National Forest part of the Panhandle National Forests on public lands administered primarily by the Bureau of Land Management (BLM) and partially by the United States Forest Service (USFS) and on private land owned and logged by Plum Creek Timber Company. The study area may be found on the Widow Mountain 7.5 minutes quadrangle T 43 N, R 4 E, Sections, 1, 2 ,3, 4, 10, 11, 12, 14, 15, 24, 25, 26 and R 5 E Section 18.

The stream section on the Little North Fork Clearwater River started at the confluence of Lost Lake Creek in the south half of Section 1, and extended up to approximately 500 yards of its outflow from Fish Lake. Each of the study areas on the tributaries began at the confluence with the Little North Fork Clearwater River. Lost Lake and Little Lost Lake Creeks were surveyed to their headwaters and Lund Creek, to the first migration barrier near the corners of Sections 23, 24, 25 and 26.

METHODS

Streams were surveyed by an experienced crew familiar with bull trout redd identification and preferred habitat. Stream channels were walked by one or two individuals. Redds and fish were observed visually, and approximate locations were determined using a map and compass. The survey was performed on September 30 - October 3, 1996 and all streams were walked upstream with the exception of the part of Lost Lake Creek down from Forest Road 1925 to the mainstem Little North Fork of the Clearwater. In addition to bull trout redd counts, a general description of the habitat in each surveyed section was also included.

RESULTS

Habitat conditions appeared to be variable throughout the streams. Substrate included fine sand to boulders. Some areas of cobble and boulders were embedded but no measurements for embeddedness were taken. Areas of bedrock were also present.

Lund Creek

Substrate was dominated by small to large boulders and large cobble. Gravel patches of sufficient size and quality for spawning were uncommon, however, there were some favorable areas that appeared unused. Substrate appeared stable and partially imbedded. Stream banks were mostly stable and there were several pools of varying depth, many of which appeared to be sufficient overwinter habitat. There was an abundance of large organic debris in the channel along with some undercut banks and some overhanging vegetation and much of the stream was shaded.

Little Lost Lake Creek

The stream channel was cut and braided immediately above Forest Service Road 720. The braided section was formed in areas of downed large woody debris. There were many pools and much cover from log jams, root wads and undercut banks. Most pools were small and shallow and the substrate throughout the lower and middle reaches of the stream channel appeared unstable. Cobble and gravel were bright and scoured and signs of channel deviation were apparent due to aggradation. At one point the stream became subsurface. No evidence of redd building was observed beyond this point. Bedrock substrate was common in the upper reaches. Bank stability was inconsistent throughout the channel. The upper reaches tended to be more stable than the lower ones and much of the middle reaches were overgrown with small woody vegetation and undercut banks were common. The condition of this channel indicated vulnerability to flooding.

Lost Lake Creek

The area between the confluence with Little North Fork Clearwater and Forest Road 1925 was mostly cobble substrate with pockets of gravel. Spawning habitat appeared available but unused. The bridge was out at the crossing of Road 1925 and it was replaced by an undeveloped ford for ATV traffic. A helicopter logging operation, probably Plum Creek Timber, was staged on the north side of this ford. From this point up stream, the channel was unconfined and meandering, much of it running under vegetation, grasses and clumpy mats, similar to habitat found on Little Lost Lake Creek above Road 720. Log jams and downed woody debris occupied the channel which was braided to the point where it was difficult to distinguish the main channel from side channels. At some points, the channel was hidden.

Hiding cover was abundant, formed by downed logs and grassy overhangs. Substrate in this braided section was predominately sand and very fine sediment with occasional pockets of gravel. The gradient was flat and water velocity was slow. Pools were present but possibly too shallow for overwintering. The channel narrows to a single channel with live standing trees on the stream bank, and in-stream shading increased. The substrate changed to chicken egg sized gravel and smaller, and there are many good pools with good water flow. A bedrock waterfall with a drop of 6 feet appeared to be a possible barrier to fish passage. Above three rock waterfalls, the gradient flattened and the substrate was dominated by sand and gravel.

Little North Fork Clearwater

Habitat appeared good with much large woody debris in the stream. Cobble/boulder substrate with pockets of gravel in the lower stretches and boulder substrate was dominant. Gravel and sand dominated the substrate farther upstream. The west edge in Section 3 had more sand and gravel and not as much loose boulder and cobble. Banks and substrate appeared moderately stable. Pools were present and sufficiently deep for overwinter habitat. There were some log drops with water running under logs in Sections 3 and 4. Some log jams were present but these were not barriers to fish passage. The channel was more confined in Section 4 and appeared to be a steeper gradient.

Bull Trout and Redds

Only one adult bull trout was observed (Table 1). This fish was approximately 400 mm long. One fish, 250 mm long, appeared to be char but, was not positively identified as a bull trout. These sightings were both in Lund Creek. The other streams contained fish observed by the surveyors but none were positively identified as bull trout.

Redds appeared at pool tailouts or on the sides of pools. Most redds (seven) were observed in Lund Creek and those in Section 24 (Table 1). One redd and one possible redd were located near the confluence of Lund Creek with the Little North Fork. One definite redd was located in Little Lost Lake Creek. Two redds were observed in the Little North Fork. Gravel disturbances were classified as a possible redd if the disturbance resembled a normal redd but did not contain all the identifying factors of a complete redd. Time passage along with animal traffic and flow with fine deposition on the available gravel lead us to conclude we were there simply too late in the year.

Due to fine sediment deposition and probable animal footprints we were unable to positively identify all the bull trout redds present. Conducting the redd survey a week earlier may resolve this problem.

DISCUSSION & MANAGEMENT IMPLICATIONS

Lund Creek appeared to have the strongest and most consistent bull trout population in the study area. Lund Creek had the highest number of redds in 1996 (Table 1). Using the 3.2 bull trout/redd expansion (Fraley et al 1981), there were approximately 22 adult bull trout in Lund Creek prior to September 30, 1996. Overman and Davis (1995) reported observing 6 bull trout in August 1995 and Willmont (1994) reported 1 adult bull trout in September 16-22, 1994 (Table 2).

The other surveyed tributaries, Lost Lake Creek, Little Lost Lake Creek and Little North Fork Clearwater River, appeared to have inconsistent populations of bull trout (Table 2). In 1996, 0, 1, and 2 redds were observed in Lost Lake Creek, Little Lost Lake Creek and LNFCR, respectively (Table 2). In 1995, Overman and Davis (1995) reported observing 5, 2, and 0 bull trout (adults or juveniles) in Lost Lake Creek, Little Lost Lake Creek and LNFCR, respectively (Table 2). In 1994, Willmont (1994) reported observing 1, 1, and 6 adult bull trout in Lost Lake Creek, Little Lost Lake Creek and LNFCR, respectively (Table 2).

The bull trout population in the study area is tenuous at best. Bull trout are vulnerable to habitat degradation (Pratt and Huston 1993). Efforts by all land owners or administrators should be made to reduce land management activities that could cause negative changes to bull trout habitat.

LITERATURE

Fraley, J.J., D. Reed, and P.J. Graham. 1981. Flathead river fishery study. Montana Department Fish, Wildlife and Parks. Kalispell, Montana.

Overman, D.J. and J.A. Davis. 1995. Distribution of bull trout and habitat classification in the Little North Fork Clearwater River, Lund, Little Lost Lake, and Lost Lake creeks, Idaho, 1995. Mimeograph, Idaho Department of Fish and Game, Panhandle Region, Coeur d'Alene.

Pratt, K.L. and J.E. Huston. 1993. Status of bull trout (*Salvelinus confluentus*) in Lake Pend Oreille and the lower Clark Fork River: Draft. Washington Water Power Company. Spokane Washington.

Willmont, L.D. 1994. Distribution of live bull trout and bull trout redds in the upper Little North Fork Clearwater River drainage and upper Marble Creek drainage, Idaho. Mimeograph, Idaho Department of Fish and Game, Panhandle Region, Coeur d'Alene.

Table 1. Number of bull trout redds and habitat characteristics of Lund, Lost Lake, and Little Lost Lake creeks, and Little North Fork Clearwater River, Idaho, October 1996.

Location	Barriers	Adult BT	Redds	Possible Redds	Total fish observed, all spp.
Lund Creek	waterfalls bedrock, corner of Sections 23,24,25&26	one, approximately 16" length one Char BT or BRT, 10"	7, mostly in section 24, 1 near confluence of Lund Cr/LNFC	7 possible. If they were true redds, time had passed making positive id impossible	5
Little Lost Lake Creek	Stream runs underground less than two miles from the confluence Bedrock waterfalls above	None	1	1	7
Lost Lake Creek	Bedrock waterfalls	No BT, but many RBT	0	1	9
Little North Fork	Insufficient flow high in drainage	None	2	2	1, +~20 fry

Table 2. Comparison of the number of bull trout redds and live bull trout in The Little North Fork Clearwater River, Lund, Little Lost Lake, Lost Lake creeks, Idaho, 1994-1996.

	1994[1]		1995[2]		1996[3]	
Streams	No. fish	No. redds	No. fish	No. redds	No. fish	No. redds
Lund Cr	1	0	6	--	1	7
Little Lost Lake Cr.	1	0	2	--	0	1
Lost Lake Cr.	0	0	5	--	0	0
Little North Fork Clearwater River	6	0	0	--	0	2

1 Survey dates September 16-22, 1994
2 Survey dates August 1995
3 Survey dates September 30 - October 3, 1996

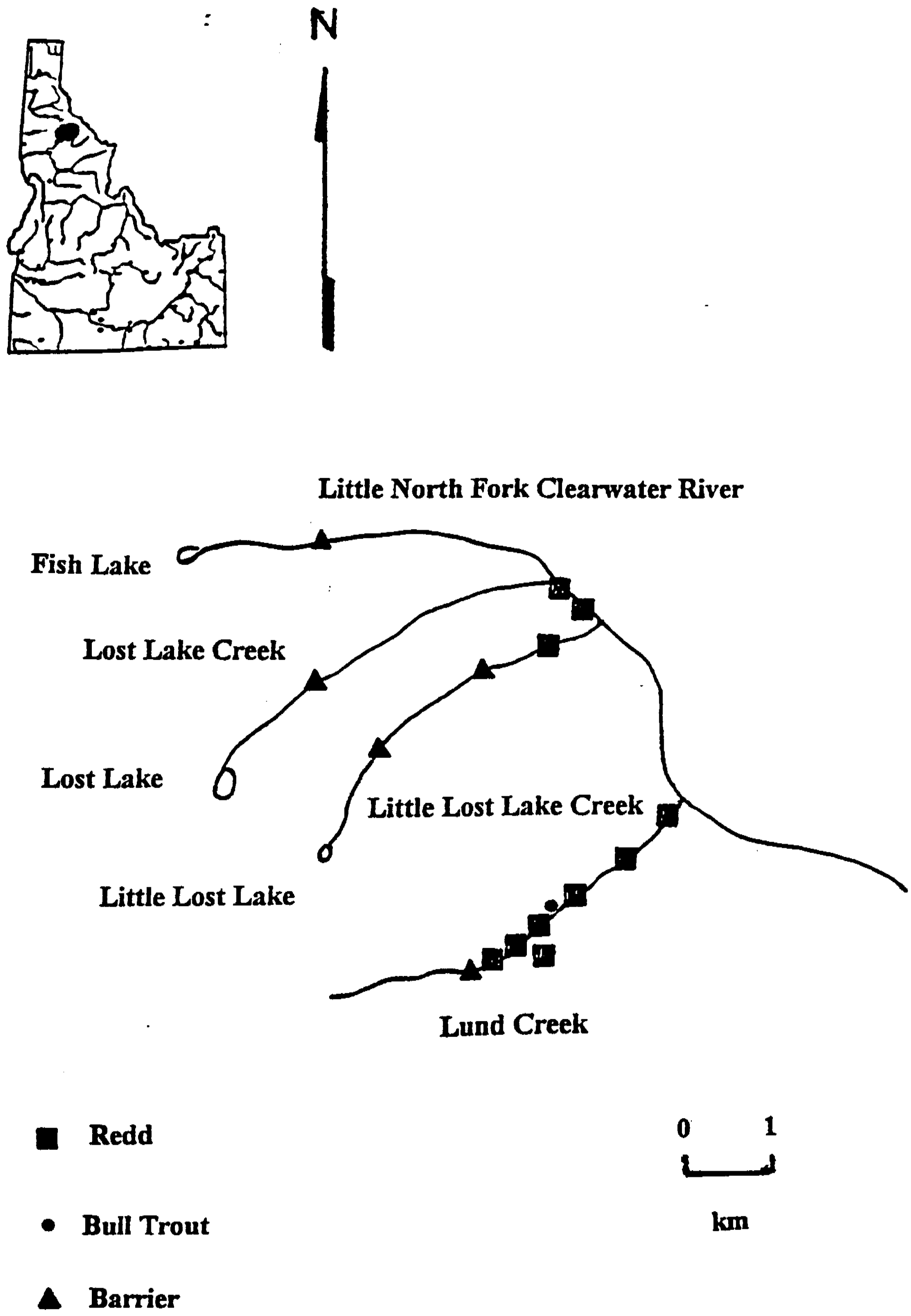

Figure 1. General locations of bull trout, bull trout redds and barriers in the Little North Fork Clearwater River, Lund, Little Lost Lake, and Lost Lake creeks, Idaho, 1996.

Appendix K. Trout population estimates and densities, for age one and older trout, for streams sampled by Division of Environmental Quality in 1996. All estimates are for cutthroat trout unless indicated. Population estimates were calculated by determining the capture efficiency of two pass estimates and applying this factor to one pass.

Drainage	Stream	Number of cutthroat sampled		Population estimate	Stream transect length (m)	Stream transect mean width (m)	Stream transect area (m^2)	Trout density	
		Pass 1	Pass 2					fish/m^2	fish/100 m^2
Coeur d'Alene River									
	Eagle Creek	46	--	73	112	8	896	0.08	8.2
	W.F. Eagle Creek	23	--	37	159	7	1,113	0.03	3.3
	E.F. Eagle Creek	47	--	75	166	8	1,328	0.06	5.7
	Shoshone Creek lower	6	--	10	170	8	1,360	0.01	0.7
	Shoshone Creek upper	14	3	17	107	5	535	0.03	3.2
	Teepee Creek lower	14	--	22	130	6	780	0.03	2.9
	Teepee Creek upper	34	--	54	101	1.8	182	0.3	29.7
	Trail Creek	14	--	22	139	6	834	0.03	2.7
	Steamboat Creek lower	6	--	10	165	8	1,320	0.01	0.86
	Steamboat Creek upper	5	--	8	137	5	685	0.01	1.2
	Carlin Creek	63	--	100	107	5	535	0.19	18.7
	Turner Creek	67	--	106	100.5	5	503	0.21	21.1
	Calamity Creek	16	5	22	106	4	424	0.05	5.2

Appendix K. Continued.

Drainage	Stream	Number of cutthroat sampled		Population estimate	Stream transect length (m)	Stream transect mean width (m)	Stream transect area (m^2)	Trout density	
		Pass 1	Pass 2					fish/m^2	fish/100 m^2
St. Maries River	Latour Creek	16	8	28	123	6	738	0.04	3.8
	Beaver Creek lower	52	--	83	138	6	828	0.1	10.0
	Beaver Creek upper	33	8	42	112	5	560	0.08	7.5
	Beaver Creek cutthroat	2	--	3	120	2	240	0.01	1.3
	brook trout	8	--	13	120	2	240	0.05	5.4
	total trout	10	--	16	120	2	240	0.07	6.7
	Merry Creek upper	13	--	21	100	3.4	340	0.06	6.2
	M.F St. Maries River lower	3	--	5	142	7.4	1,051	0.01	0.5
	middle	11	--	17	150	9.1	1,365	0.01	1.3
	upper	17	--	27	111.7	4.1	458	0.06	5.9
	Charlie Creek cutthroat	17	--	27	125	5.5	688	0.04	3.9
	rainbow	1	--	2	125	5.5	688	0.00	0.3
	brook	6	--	6	125	5.5	688	0.01	0.9
	total	22	--	35	125	5.5	688	0.05	5.1
	Gold Center Creek lower	8	--	13	121	5.7	690	0.02	1.9

Appendix K. Continued.

Drainage	Stream	Number of cutthroat sampled		Population estimate	Stream transect length (m)	Stream transect mean width (m)	Stream transect area (m^2)	Trout density	
		Pass 1	Pass 2					fish/m^2	fish/100 m^2
	Gold Center Creek upper	8	--	13	132	5.6	739	0.02	1.8
	Gramp Creek	9	--	14	103	3.3	340	0.04	4.1
	Flewsie Creek cutthroat	4	--	6	100	1.8	180	0.03	3.3
	brook	44	--	70	100	1.8	180	0.39	38.9
	total	48	--	76	100	1.8	180	0.42	42.2
	Tyson Creek	11	--	17	100	1.4	140	0.12	12.1
St. Joe River									
	Skookum Creek	18	4	22	109	5	545	0.04	4.0
	Gold Creek lower	53	--	84	180	7.7	1,386	0.06	6.1
	upper	42	--	67	143	7.3	1,044	0.06	6.4
	Quartz Creek	23	--	37	121	6.9	835	0.04	4.4
	Eagle Creek lower	65	--	103	152	7.6	1,155	0.09	8.9
	upper	63	--	100	157	7.0	1,099	0.09	9.1
	E.F. Bluff Creek	39	--	62	129	5.2	671	0.09	9.2
	W.F. Bluff Creek	48	--	76	146	6.3	920	0.08	8.3
	Bird Creek	20	--	32	130	5.3	689	0.05	4.6
	Alpine Creek	98	--	156	106	5.0	530	0.29	29.4

Appendix K. Continued.

Drainage	Stream	Number of cutthroat sampled		Population estimate	Stream transect length (m)	Stream transect mean width (m)	Stream transect area (m^2)	Trout density	
		Pass 1	Pass 2					fish/m^2	fish/100 m^2
	Bond Creek lower cutthroat	6	--	10	120	7.1	852	0.01	1.2
	brook	2	--	3	120	7.1	852	0.00	0.4
	total	8	--	13	120	7.1	852	0.01	1.5
	Bond Creek upper cutthroat	7	5	15	100	4.7	470	0.03	3.2
	brook	6	6	24	100	4.7	470	0.05	5.1
	total	13	11	48	100	4.7	470	0.1	10.2
	Davegio Creek	27	--	43	121	6.2	750	0.06	5.7
	Blackjack Creek	10	--	16	103	3	309	0.05	5.2
	Norton Creek	21	--	33	116	5.3	615	0.05	5.4
	Prospector Creek	32	5	37	105	5	525	0.07	7.1
	Bruin Creek	20	14	55	114	4.2	479	0.11	11.5

Appendix L. Summary of impromptu creel interviews conducted by conservation officers for several rivers and creek in northern Idaho, 1996.

Drainage	River/ Creeks (# officer visits)	Res.	Nres	Hours Fished	Catch Rates						
					Bk	Ct	Bt	Sq	Bn	Hrb	Bc
Kootenai	Moyie R. (2)	16	4	28						0.29	
	Smith Ck. (1)	1		0.5							
	Kootenai R. (2)	12	2	22		0.05				0.36	
Spokane	Cda. River (4)	22	8	120		0.12				0.008	
	St. Joe R. (5)	37	18	15		0.67		0.03		0.11	
	Marble Ck.(2)	4	8	28		1.96					
Pend Orielle	HoodooCk.(3)	6	2	4	0.25				0.25		
	Cedar Ck. (1)	2		1							
	M. F. East R.(1)	2		1							
	R. Lightening Ck. (3)	2		3		0.33					
	Grouse Ck. (1)	5	2	10							
	Trestle Ck. (3)	2	2	3							
	Cow Ck. (1)	20	1								
	Pack R. (14)	8	2	31							0.06
	Lightening Ck. And tribs. (8)	26	1	20		0.6	0.3				
	Clark Fork (17)	1	4	39					0.31		
	Middle Fk. E. R.(1)	2		1							
	Priest R. (20)	2	2	2						5	

BK= brook trout CT= cutthroat BN= brown trout SQ = squawfish BC = black crappie HRB = hatchery rainbow

1996 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-21

Project: II- Technical Guidance Subproject: I-A - Panhandle Region

Contract Period: July 1, 1996 to June 30, 1997

ABSTRACT

Panhandle Region fisheries management personnel provided private individuals, organizations, public schools, and state and federal agencies with technical review and advice on various projects and activities that affect the fishery resources in northern Idaho. Technical guidance also included numerous angler informational meetings, presentations, and letters, continuation of the Panhandle Region portion of the 1-800 ASK-FISH program, and fishing clinics.

Author:

Ned Horner
Regional Fishery Manager

OBJECTIVES

1. To furnish technical assistance, advice and comments to other agencies, organizations, or individuals regarding projects that affect fishery resources in northern Idaho.

2. To promote the understanding of fish biology and fish habitat needs and the ethical use of the fishery resource through individual contact, public school curriculum, club meetings, public presentations, informational brochures and fishing clinics.

METHODS

Regional fisheries management personnel provided both written and oral technical guidance.

RESULTS AND DISCUSSION

The technical guidance provided by Panhandle Region fish management personnel focused on activities that directly affected fishery resources or resource users in north Idaho. Numerous presentations and programs were made to civic and sportsmen's groups throughout the year. Letters were sent to numerous individuals and organizations in response to specific questions about the fisheries in northern Idaho.

Fishing Clinics

Regional fishery management personnel coordinated five Free Fishing Day fishing clinics in the Panhandle Region. Department-sponsored clinics were held in Coeur d'Alene, Mullan, Bonners Ferry, near St. Maries and at Round Lake State Park near Sandpoint. We also provided fish and guidance for a clinic at Priest Lake sponsored by the US Forest Service. The clinics were geared toward teaching young anglers how to fish (casting, baiting hooks, etc.), fish identification, the reasons for regulations, fishing ethics and how to clean fish. The emphasis was on education and not competition. Regional personnel, people from other state and federal agencies and sportsmen's groups helped in making the clinics a big success.

1-800-ASK-FISH

Regional fishery management personnel provided information on northern Idaho fishing opportunities for the 1-800-ASK-FISH angler information program. Several tackle shops and local fishing experts were consulted weekly to provide additional information on fishing activities.

Bull Trout Issues

The Regional Fishery Manager provided information on the abundance and status of bull trout populations in Panhandle Region waters to numerous individuals, organizations and personnel from state and federal agencies working on issues related to bull trout listing.

Pend Oreille Lake Water Management

Fishery research personnel were responsible for completing all field activities, while the Fisheries Manager kept the public informed and involved in efforts to change lake level management on Lake Pend Oreille. Several sportsmen meetings were attended, articles were written and interviews were given to newspapers. The Fisheries Manager provided guidance to fisheries research personnel and University of Idaho researchers on proposed graduated student projects to insure management objectives were met.

Cabinet Gorge Relicensing

The Regional Fishery manager reviewed and commented on fisheries related issues associated with the relicensing of Washington Water Power's Cabinet Gorge Dam. The Regional Environmental Staff Biologist is coordinating relicensing comments.

Miscellaneous

Coordination meetings were held with hatchery, research, enforcement and Fisheries Bureau personnel to insure management goals were achieved. Private pond permits, transport permits and fish tournament applications were reviewed and forwarded. Requests for commercial guiding activities were reviewed and commented on. Anglers were kept informed of regional fishing opportunities at monthly Sportsmen Breakfasts. The Regional Fisheries Manager participated in a career day at the Priest River high school and attended a public outreach symposium in Bozeman, Montana.

1996 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-21

Project: III - Habitat Management Subproject: I-A - Panhandle Region

Contract Period: July 1, 1996 to June 30, 1997

ABSTRACT

Permit applications, site survey, an archeological survey and funding were obtained in 1996 to complete the restoration of the Sullivan Springs kokanee/bull trout spawning channel, tributary to Granite Creek, Lake Pend Oreille. Approximately 1,100 m^3 of old gravel were removed and replaced with new gravel and nine drop log structures were reconstructed to maximize spawning riffles. Flood damaged drop log structures were also repaired in Granite Creek below the spawning channel.

A culvert inventory program was initiated to identify impassible culverts in the Lake Pend Oreille and St. Joe River drainages. Volunteers were used to collect site specific data on both the culvert and stream channel that may preclude fish passage.

Authors:

Ned Horner
Regional Fishery Manager

Jim Davis
Regional Fisheries Biologist

METHODS

Sullivan Springs

A stream alteration permit from the Idaho Department of Water Resources and a 404 permit from the United States Army Corps of Engineers were obtained for working in the spawning channel. An archeological survey was completed by a consultant for the Idaho Historical Society of the area to be disturbed by construction activities. Funding totaling $75,000 was obtained from Washington Water Power, Lake Pend Oreille Idaho Club) and National Fish and Wildlife Foundation *Bring Back The Natives Program*, with engineering services provided by Idaho Fish and Game and cedar trees for drop log structures donated by the Forest Service. Duarte Construction, Inc. of Bonners Ferry, Idaho was selected as the contractor.

A coffer dam was built at the upstream end of the channel to divert water into a temporary pipeline and excavated channel to bypass the spawning channel. A front end loader was used to remove the old gravel and place it on access roads to the channel or above the high water mark. New washed, round river gravel, mainly from 2 to 4 cm in diameter were used to replace the old gravel. Eight drop log structures were built to control channel gradient and maximize spawning riffles. Drop log structures were constructed with 30 cm minimum diameter cedar logs stacked two per structure, pinned with rebar and cabled together with 50 mm cable, and buried in the banks above the high water mark.

Granite Creek

Three old drop log structures in Granite Creek below the Sullivan Springs spawning channel were damaged by the February flood of 1996. Cedar logs, angular rock and 50 mm cable were used to restore the damaged portions of the structures to prevent total failure.

Culvert Inventory

Volunteers were given maps identifying specific stream routes where culverts needed inspection. An instruction sheet (Appendix A) identified specific measurements to take at each couvert site. Eight routes were identified in the Lake Pend Oreille drainage and 13 in the St. Joe River drainage. The Pend Oreille and St. Joe drainages were prioritized because they are two of the last strongholds for bull trout in the Panhandle Region.

RESULTS AND DISCUSSION

Sullivan Springs Kokanee/Bull Trout Spawning Channel

The Sullivan Springs spawning channel, tributary to Granite Creek on Lake Pend Oreille, was originally constructed in 1957 as mitigation for impacts from the Cabinet Gorge Dam on the Clark Fork River. Sullivan Springs supports the most significant tributary spawning run of kokanee and is the major egg source for hatchery fish for Lake Pend Oreille. Sullivan Springs has also been utilized by significant numbers of bull trout.

An analysis of the spawning gravel in 1995 indicated that the percent fines in the gravel exceeded 90%. The old drop log structures were rotting out and it was necessary to replace both the gravel and drop log structures to restore Sullivan Springs to maximum production.

The Regional Fishery Manager worked with the Cabinet Gorge Hatchery Manager, Engineering Bureau Chief, Grant Coordinator, Washington Water Power, and Lake Pend Oreille Idaho Club to conduct the necessary instream and archeological surveys, secure permission from landowners and secure permit applications to reconstruct the Sullivan Springs spawning channel. Funding was received from Washington Water Power ($50,000), Lake Pend Oreille Idaho Club ($15,000) and National Fish and Wildlife Foundation *Bring Back The Natives Program* ($10,000), with engineering services provided by Idaho Fish and Game and cedar trees for drop log structures donated by the Forest Service. Duarte Construction, Inc. of Bonners Ferry, Idaho was selected as the contractor.

Channel reconstruction began in late July 1996 and was completed approximately 30 days later. One additional drop log structure was added to the lower end of the channel to reduce the gradient drop. That structure failed because the logs were not buried deep enough into the stream bank or bed. The structure was repaired by cutting a notch out of the log and armoring the banks. Algae quickly colonized the gravel. Bull trout utilized the spawning channel in late September and kokanee were spawning by mid November. The project was a success thanks to the cooperative efforts and funding of all involved.

Granite Creek

High flows from the February flood of 1996 washed over the Granite creek flood plain and eroded the bank away from the ends of three drop log structures in Granite creek below the Sullivan Springs spawning channel. These structures form holding pools that are used by kokanee on their way to the spawning channel and bull trout spawn in the gravel trapped above the structures. Failure to repair the structures would have lead to the eventual loss of the structures and the critical fish habitat they provide.

Fish management and fish hatchery personnel as well as volunteers reconstructed three structures. Cedar logs were spliced into the original drop logs using spikes and cables and the banks were reconstructed and armored with angular rock. The reconstructed banks were intentionally left low so flood flows would over flow in areas that were armored and resistant to erosion.

Culvert Inventory

Most salmonid habitat in the Panhandle Region is located on forested lands, much of that within the boundaries of the Panhandle National Forest. Over 10,000 km of roads have been constructed to access the forests and extract timber and the number of culverts in those roads is in the tens of thousands. Improperly installed culverts can block access to useable habitat for upstream migrating salmonids. It is a high priority to identify culverts that have excluded salmonids from utilizing significant amounts of spawning and rearing habitat and work with land manages to fix those blockages.

Volunteers were given maps and instruction sheets on the routes needing inspection. The required measurements included: length and diameter of the culvert, culvert gradient, drop from the bottom of the culvert to the plunge pool, depth of the plunge pool and velocity in the culvert. Velocity was measured by timing a floated object through the culvert. A video was produced describing how to make these measurements. Volunteers had not yet completed the assigned routes as of this report.

Appendix A. Instructions for stream culvert inventory.

INSTRUCTIONS FOR CULVERT MEASUREMENTS

1. Set or mark odometer mileage at beginning of the road.

2. Record stream name.

3. Record road name or number (i.e. Lightning Creek Rd. or FS 489).

4. Record mileage to first culvert. Identify culvert as #1, #2.... etc.

5. Make culvert measurements.

   a. **Culvert length**- use tape measure and measure from one end to the other. Record distance in feet and inches.

   b. **Culvert diameter**- measure across the widest point.

   c. **Culvert drop** -

   outlet (downstream end)- measure from the bottom of the culvert to the top of the water.

   inlet (upstream end)- measure from the bottom of the culvert to the top of the water (usually 0).

   d. **Velocity**- measure the time (**in seconds**) that it takes a rubber ball, tennis ball, orange or a stick to float through the culvert. Do this **twice** and record the average time.

   e. **Plunge pool depth**- measure the depth of the water where it lands at the downstream end of the culvert.

   f. **Comments**- does the culvert empty onto rocks or into a pool.

TOOLS NEEDED

1. Tape measure
2. Staff (i.e. broom handle) marked in 6 inch increments, minimum 4 feet long for depth.
3. Tennis or rubber ball, orange or stick for velocity measurements.
4. Watch with second hand or stop watch.
5. Data sheets and map
6. Hip boots (optional)

1996 ANNUAL PERFORMANCE REPORT

State of: Idaho Program: Fisheries Management F-71-R-2l

Project: IV - Population Management Subproject: I-A -Panhandle Region

Contract Period: July 1, 1996 to June 30, 1997

ABSTRACT

No lakes in the Panhandle Region were restored with rotenone during this contract period.

Panhandle Region lowland lakes and rivers were stocked with 174,970 put-and-take rainbow trout. Put-grow-and-take stocking included 271,626 domestic Kamloops rainbow trout and 435,821 cutthroat trout. Net pen releases of age 1 westslope cutthroat trout in Lake Pend Oreille in 1996 totaled 52,930 fish. Other trout species stocked included 18,015 brook trout and 4,023 brown trout fingerlings. Five lowland lakes were stocked with 180,300 kokanee fry and Lake Pend Oreille was stocked with over 10 million kokanee fry in 1996. Coeur d'Alene Lake received 39,700 fall chinook fingerlings. Channel catfish and tiger muskies were not available for stocking in 1996.

Hatchery personnel and volunteers stocked 30 mountain lakes in the Panhandle Region in 1996. Most lakes were stocked at a density of around 620 fish/ha. Species stocked included westslope cutthroat trout, domestic Kamloops rainbow trout, golden trout and grayling.

Authors:

Ned Horner
Regional Fishery Manager

Jim Fredericks
Regional Fisheries Biologist

OBJECTIVES

1. Utilize rotenone to restore lowland lakes to productive trout fisheries when undesirable species become too numerous and there is support from the angling public.

2. Stock lowland lakes and sections of rivers to provide productive trout fisheries where wild trout recruitment is inadequate or angler effort is too high to maintain a fishery with wild production alone.

3. Stock low densities of kokanee fry in select lowland lakes to create a unique fishery for large kokanee.

4. Utilize net pens to rear westslope cutthroat trout for release in Lake Pend Oreille.

5. Stock hatchery reared channel catfish and tiger muskies to provide unique fisheries.

6. Provide diverse angling opportunities in mountain lakes of the Panhandle Region by maintaining a stocking program with different species of salmonids.

INTRODUCTION

Lowland and mountain lakes in the Panhandle Region are capable of growing trout and salmon, but recruitment from wild fish is lacking or inadequate to provide a fishery without stocking. Kokanee fry, put-grow-and-take (fingerling) rainbow, cutthroat and a few brook and brown trout, and put-and-take (catchable) rainbow are utilized to create salmonid fisheries depending on the productivity of the lake and amount of angling effort it receives. Kokanee fry from the Cabinet Gorge Hatchery are stocked in Lake Pend Oreille to supplement wild production lost to the construction of Albeni Falls and Cabinet Gorge dams. Westslope cutthroat fingerlings are reared in net pens and released in Lake Pend Oreille. The net pen program is a cooperative project between local angling clubs, Washington Water Power and Idaho Fish and Game.

Some rivers are also stocked with put-and-take rainbow trout, but only where angler access is good and fishing effort is high. Stocked river sections are signed and advertized in brochures to improve returns, but the statewide guideline of a 40% return to the creel by numbers generally is not being met. Methods to increase returns, such as stocking fewer fish more frequently, stocking larger fish or sterile fish, are being evaluated. Another alternative is to further reduce hatchery trout stocking in rivers, but this will require better public acceptance of restrictive regulations capable of maintaining wild trout. It may also involve the development of alternative fisheries, like catch out ponds built along rivers.

New fisheries for warm water species have been created by stocking channel catfish and tiger muskies in a few Panhandle Region lowland lakes. These fisheries will depend on continued maintenance stocking because summer temperatures are not adequate for channel catfish to reproduce and tiger muskies are a sterile hybrid.

METHODS

Lake restoration follows standard procedures in the lake renovation procedures manual (Horton 1997).

Hatchery personnel stocked put-and-take rainbow trout into lowland lakes and drive to mountain lakes throughout the Panhandle Region and sections of river in the Coeur d'Alene River, St. Joe River, and Moyie River drainages. Put-grow-and-take rainbow and cutthroat were utilized in larger lowland lakes or where a cutthroat fishery is desired. Net pen cutthroat were stocked as described in Horner et al. (1996). Brook trout were stocked in Bloom Lake, Mirror Lake, and Perkins Lake and brown trout were stocked in Hoodoo Creek to provide specialty fisheries. Fall chinook were stocked in Coeur d'Alene Lake to supplement wild production. Kokanee fry were stocked in five lowland lakes in densities ranging from approximately 140 to 750 fry/ha to provide fisheries for large kokanee. Kokanee fry from the Cabinet Gorge Hatchery were stocked in the Clark Fork River, Sullivan Springs (tributary to Granite Creek on the east side of Lake Pend Oreille), Spring Creek (tributary to lower Lightning Creek on the north east side of Lake Pend Oreille), and along the north shore of Lake Pend Oreille to supplement this regionally important kokanee fishery.

Mountain lakes were stocked with salmonid fry according to the even year schedule of the Panhandle Region mountain lakes stocking schedules (Appendices A and B). Stocking was completed by hatchery personnel and volunteers using backpacks, horses, and where accessible, motorized vehicles.

RESULTS AND DISCUSSION

Lake Restoration

No lakes were treated with rotenone in 1996.

Salmonid Stocking

In 1996, a total of 174,970 put-and-take rainbow trout were stocked in the Panhandle Region, 136,019 in 27 lowland and drive to mountain lakes and 38,951 in eight rivers. Hayspur, domestic Kamloops and unspecified stocks of rainbow trout were used for put-and-take stocking.

Fingerling westslope cutthroat trout from the Clark Fork Hatchery were stocked in 13 lakes to provide put-grow-and-take fisheries. A large number of surplus fry, fingerlings and brood stock cutthroat were available in 1996 and they were utilized in nine other lakes. (Table 1).

Fingerling brook trout were stocked in Bloom Lake, Mirror Lake, and Perkins Lake to maintain popular put-grow-and-take fisheries. Hoodoo Creek is the only water in the Panhandle Region stocked with brown trout (Table 2).

Five lowland lakes in the Panhandle Region were stocked with low densities of kokanee fry to provide a unique fishery for larger than average sized kokanee (Table 2). Kokanee harvested from lakes managed as high yield fisheries (Coeur d'Alene Lake, Spirit Lake, and Lake Pend Oreille) typically average about 25 cm. In the lakes stocked with low densities of kokanee fry, fish from 38 cm to 56 cm have been caught, but catch rates are typically low and kokanee are included in the aggregate trout limit of 6 fish. Over 10 million kokanee fry from the Cabinet Gorge Hatchery were stocked in Lake Pend Oreille (Table 2).

Coeur d'Alene Lake is the only Panhandle Region water stocked with chinook salmon (Table 2). A detailed report on the Coeur d'Alene Lake chinook/kokanee program is in Job 1-b of this report. Detailed stocking records for all species stocked in the Panhandle Region are available in the Idaho Department of Fish and Game 1996 stocking records booklet available through individual hatcheries and regional or headquarters offices.

Net Pen Cutthroat Trout

A total of 52,930 one year old westslope cutthroat trout were released from eight net pens located in Ellisport, Scenic, and Garfield bays on Lake Pend Oreille, Idaho, in April, 1996 (Table 3). Average length of of fish in each net pen ranged from 140 mm to 198 mm, with an overall average of 160 mm. Cutthroat in nets located at Harbor Marina were not fed throughout the winter, resulting in the smaller average sizes at those three locations. Thirty-five squawfish gained access to the net pen located fish at East Hope, Ellisport Bay, and only 915 cutthroat were remaining in the net for release on May 13 (Table 3). Every cutthroat trout received an adipose fin clip prior to being placed in the net pens in the fall of 1995. Since the inception of the program in the fall of 1989 (Horner et al., 1995), a total of 345,549 westslope cutthroat trout have been reared in net pens and released in Lake Pend Oreille (Table 3). Net pen releases, with the exception of 1994, when 15,030 two year old fish were released (Horner et al., 1997), consisted of one year old cutthroat. In 1994, to evaluate the return to the creel of one year old and two year old releases, 145 one year old cutthroat and 148 two year old cutthroat were floy tagged. No tags were returned by anglers in 1996.

Mountain Lake Stocking

Thirty mountain lakes were stocked in 1996 (Appendix C). Twenty-four lakes were stocked with westslope cutthroat trout, one lake was stocked with domestic kamloops rainbow trout, three lakes were stocked with grayling, and two lakes were stocked with a combination of grayling and golden trout. Fish were stocked at a density of 620 fish/hectare in the majority of lakes (23 of 30). Grayling were stocked at densities of 410 to 1,535 fish/hectare, and golden trout were stocked at densities of 855 and 3,720 fish/hectare.

Table 1. Summary of cutthroat trout stocked in lowland lakes of the Panhandle Region, northern Idaho, in 1996.

Species Stocked	Lake Stocked		Number Stocked	Comments
Cutthroat Trout				
Fingerling Program	Cocolalla Lake		58,299	
	Fernan Lake		37,513	
	Hauser Lake		68,372	
	Hayden Lake		100,028	
	Mirror Lake		9,996	
	Spirit Lake		25,126	
	Lower Twin Lake		44,260	
	Lake Pend Oreille		39,297	North shore release
	Lake Pend Oreille		52,930	Net pen program
		Total	435,821	
Surplus Fry	Brush Lake		4,223	
	Cocolalla Lake		116,115	
	Fernan Lake		43,492	
	Hauser Lake		86,997	
	Kelso Lake		8,706	
	Perkins Lake		8,708	
	Smith Lake		4,427	
	Lower Twin Lake		50,854	
	Upper Twin Lake		72,830	
		Total	396,352	
Surplus Fingerlings	Bonner Lake		5,620	
	Kelso Lake		6,011	
	Perkins Lake		5,975	
	Smith Lake		3,114	
	Upper Twin Lake		50,037	
		Total	70,757	
Surplus Broodstock	Antelope Lake		1,014	
	Cocolalla Lake		115	
	Hayden Lake		5,477	
	Jewel Lake		3,005	Sub. for fingerlings
		Total	9,611	

Table 2. Summary of fingerling rainbow, brook and brown trout, kokanee fry and fall chinook salmon fingerlings stocked in lowland lakes of the Panhandle Region, northern Idaho, in 1996.

Species Stocked	Lake Stocked	Number Stocked	Comments
Rainbow Trout			
Fingerling Program	Hayden Lake	271,626	
Surplus Fry	Deer Creek (Moyie R.)	15,038	Colorado River Rb
	Meadow Creek	15,039	
	Total	30,077	
Brook Trout			
Fingerling Program	Bloom Lake	4,999	
	Mirror Lake	7,022	
	Perkins Lake	5,994	
	Total	18,015	
Brown Trout	Hoodoo Creek	4,023	
Kokanee			
Lowland Lake Program			
	Brush Lake	5,800	
	Hauser Lake	60,000	
	Mirror Lake	5,000	
	Smith Lake	4,500	
	Lower Twin Lake	105,000	
	Total	180,300	
Lake Pend Oreille	Clark Fork River	4,349,686	
	Sullivan Springs	4,520,724	
	Spring Creek	1,278,340	
	North Shore	1,279,385	Stocked at the Pringle Park, Boat Basin and Trestle Cr. boat ramps
	Total	10,662,048	
Fall Chinook Salmon	Coeur d'Alene Lake	39,700	Stocked at the Mineral Ridge boat ramp

Table 3. The numbers, age and size of net pen reared westslope cutthroat trout released into Lake Pend Oreille, Idaho, 1990 - 1996.

Year	No. of fish released	Age	Mean length at release (mm)	No. of net pens	Release date
1990	38,841	1	160	4	May
1991	34,870	1	171	6	May 31
1992	50,130	1	173	6	May 15
1993	46,160	1	173	6	May 15-16
1994	46,000	1	167	5	April 19-
	15,030	2	223	3	May 11
1995	57,220	1	149	6	April 19
	4,348	1	184	2	June 16
1996	52,930	1	160	8	May 6-31

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APPENDICES

Appendix A. Even year stocking schedule for Panhandle Region, Idaho, mountain lakes.

Lake	Code No.	Surface acres	No. stocked	Species	Substitute species
Kootenai					
Hidden	01-103	50	12,500	K1	C2
West Fork	01-109	12	3,000	C2	K1
Long Mtn.	01-112	3	1,500	C2	None
Parker	01-113	3	1,000	GN	GR
Long Canyon (Smith)	01-115	6	3,000	GR	None
Big Fisher	01-117	10	2,500	C2	None
Trout	01-124	7	1,750	K1	C2
Pyramid	01-125	11	2,750	C2	K1
Ball Creek	01-126	6	1,500	C2	None
Little Ball Cr.	01-127	4	1,000	C2	None
Roman Nose #3	01-137	12	3,000	C2	K1
Queen	01-148	5	1,250	C2	None
Spruce	01-154	5	1,250	C2	K1
Copper	01-155	5	1,250	C2	None
Estelle	01-167	5	1,250	BN	None
Pend Oreille					
Hunt	02-101	12	3,000	C2	None
Two Mouth #3	02-108	20	5,000	C2	None
Caribou (near West Fk. Mtn.)	02-116	7.8	1,750	C2	None
Little Harrison	02-126	6.5	1,625	C2	None
Harrison	02-129	29	7,250	C2	None
Beaver	02-130	5	1,250	BN	None
Dennick	02-171	8	2,000	C2	None
Sand	02-172	5	1,250	C2	None
Moose	02-185	16.5	4,200	BN	None
Caribou (Keokee Mtn.)	02-196	6.8	1,700	C2	None

Appendix A. Continued.

Lake	Code No.	Surface acres	No. stocked	Species	Substitute species
Spokane					
Crater	03-133	5	2,500	GR	None
Forage	03-146	13	3,250	GN	GR
LNF Clearwater					
Devils Club	06-113	4	1,000	C2	None
Big Talk	06-114	?	2,500	C2	None
Larkins	06-117	12	3,000	C2	None
Hero	06-119	4	1,000	C2	None
Heart	06-122	40	10,000	K1	None
Northbound	06-123	12	3,000	C2	None
Fawn	06-126	13	3,250	C2	None
Noseeum	06-130	4	1,000	C2	None
Steamboat	06-131	9	4,500	GR	None
Gold	06-202	8	2,000	C2	None
Tin	06-204	3	750	K1	None

Total number of fish to be stocked:

C2 - 59,075
K1 - 25,000
GR - 11,500
GN - 4,250 (Grayling can be substituted for golden trout)
BK-2 - 5,000 size 2
BN - 6,700

Appendix B. Odd-year stocking schedule for Panhandle Region, Idaho, mountain lakes.

Lake	Code No.	Surface acres	No. stocked	Species	Substitute species
Kootenai					
Hidden	01-103	50	12,500	C2	K1
Lake Mtn.(Cutoff)	01-104	7	1,750	C2	None
West Fork	01-109	12	3,000	K1	C2
Long Mtn.	01-112	3	1,500	GR	None
Parker	01-113	3	1,000	GN	GR
Long Canyon (Smith)	01-115	6	3,000	GR	None
Myrtle	01-122	20	5,000	C2	None
Pyramid	01-125	11	2,750	K1	C2
Snow	01-134	10	2,500	C2	None
Roman Nose #3	01-137	12	3,000	K1	C2
Debt	01-157	5	1,250	C2	None
Spruce	01-154	5	1,250	K1	C2
Callahan	01-166	10	2,500	C2	None
Pend Oreille					
Hunt	02-101	12	3,000	C2	None
Standard	02-103	16	4,000	C2	None
Two Mouth #2	02-107	5	1,250	C2	None
Mollies	02-114	2	500	C2	None
Fault(Hunt Pk #1)	02-121	6	1,500	C2	None
McCormick (Hunt Pk #2)	02-122	3.1	775	C2	None
Beehive	02-128	7	1,750	C2	None
Harrison	02-129	29	7,250	C2	None
Dennick	02-171	8	2,000	C2	None
Sand	02-172	5	1,250	C2	None
Bloom	02-173	20	5,000	BK*Size 2	None
Caribou (Keokee Mtn.)	02-196	6.8	1,700	C2	None

Appendix B. Continued.

Lake	Code No.	Surface acres	No. stocked	Species	Substitute species
Spokane					
Gold	03-125	3	750	K1	None
Crater	03-133	5	2,500	GR	None
Bacon	03-144	9	2,250	C2	None
Forage	03-146	13	3,250	GN	GR
Halo	03-147	12	3,000	C2	None
Crystal	03-160	10	2,500	C2	None
Little North Fork Clearwater					
Mud	06-118	6	1,500	K1	None
Skyland	06-125	13	3,250	K1	None
Noseeum	06-130	4	1,000	C2	None
Steamboat	06-131	9	4,500	GR	None
Copper	06-201	3	750	C2	None
Silver	06-205	10	2,500	K1	None

Total number of fish to be stocked:

C2 - 59,975
K1 - 18,000
GR - 11,500
GN - 5,250 (Grayling can be substituted for golden trout)
BK - 5,000 Size 2

Appendix C. Number and species of fish (fry except where noted) stocked into mountain lakes in the Panhandle Region, Idaho, from 1982-1996.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai							
	Hidden (1-103)	50	1986	6,000	120	Westslope cutthroat	
			1987	12,500	250	Westslope cutthroat	
			1988	12,096	242	Kamloops rainbow	
			1989	3,082	62	Kamloops rainbow	
			1989	12,495	250	Westslope cutthroat	
			1990	12,928	258	Kamloops rainbow	
			1991	12,500	250	Westslope cutthroat	
			1992	8,440	169	Kamloops rainbow	
			1993	12,000	2[illegible]	Westslope cutthroat	
			1994	12,500	250	Hayspur rainbow	
			1995	12,500	250	Westslope cutthroat	
	Lake Mountain (Cuttoff) (1-104)	7	1987	1,750	250	Westslope cutthroat	
			1989	1,750	250	Westslope cutthroat	
			1991	1,750	250	Westslope cutthroat	
			1995	1,750	250	Westslope cutthroat	
	West Fork (1-109)	12	1986	4,495	375	Westslope cutthroat	
			1987	3,000	250	Westslope cutthroat	
			1988	3,007	250	Westslope cutthroat	
			1989	3,087	257	Kamloops rainbow	
			1990	3,000	250	Westslope cutthroat	
			1991	3,000	250	Kamloops rainbow	
			1992	3,000	250	Westslope cutthroat	
			1993	3,006	250	Kamloops rainbow	
			1994	3,000	250	Westslope cutthroat	
			1995	3,000	250	Westslope cutthroat	
			1996	1,757	146	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai							
	Long Mountain (1-112)	3	1987	1,000	333	Grayling	
			1990	1,500	500	Grayling	
			1991	1,500	500	Grayling	
			1992	664	331	Grayling	
			1993	1,500	500	Grayling	
			1995	1,505	501	Westslope cutthroat	Cutthroat stocked by mistake
			1996	1,152	384	Graying	
			1996	1,039	346	Golden trout	
	Parker (1-113)	3	1986	1,225	408	Golden trout	
			1988	1,002	334	Grayling	
			1990	1,410	470	Golden trout	
			1991	1,500	500	Grayling	
			1992	265	122	Grayling	
			1993	1,042	347	Grayling	
			1995	1,000	333	Grayling	
			1996	500	166	Grayling	
			1996	4,517	1,505	Golden trout	
	Long Canyon (Smith) (1-115)	6	1987	2,000	333	Grayling	
			1988	3,000	500	Grayling	
			1990	3,000	500	Grayling	
			1991	1,000	167	Grayling	
			1993	704	117	Grayling	
			1995	3,000	500	Grayling	
	Big Fisher (1-117)	10	1983	2,486	248	Henrys Lake cutthroat	
			1985	2,530	253	Westslope cutthroat	
			1987	2,500	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai							
	Big Fisher (cont'd)		1990	2,500	250	Westslope cutthroat	
			1992	2,500	250	Westslope cutthroat	
			1994	2,500	250	Westslope cutthroat	
			1996	2,514	251	Westslope cutthroat	
	Myrtle (1-122)	20	1987	5,000	250	Westslope cutthroat	
			1989	5,000	250	Westslope cutthroat	
			1991	4,953	248	Westslope cutthroat	
			1993	5,075	254	Westslope cutthroat	
			1995	5,000	250	Westslope cutthroat	
	Trout (1-124)	7	1986	1,721	246	Westslope cutthroat	
			1987	1,751	250	Westslope cutthroat	
			1988	1,743	250	Westslope cutthroat	
			1990	1,750	250	Westslope cutthroat	
			1992	1,750	250	Kamloops rainbow	
			1994	1,750	250	Kamloops rainbow	
	Pyramid (1-125)	11	1986	2,741	249	Westslope cutthroat	
			1987	2,750	250	Westslope cutthroat	
			1988	2,752	250	Westslope cutthroat	
			1989	2,750	250	Kamloops rainbow	
			1990	2,765	251	Westslope cutthroat	
			1991	2,750	250	Kamloops rainbow	
			1992	2,750	250	Westslope cutthroat	
			1993	2,805	255	Kamloops rainbow	
			1994	1,750	250	Westslope cutthroat	
			1995	4,000	364	Westslope cutthroat	Requested 250/ac
			1996	2,762	251	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai							
	Ball Creek (1-126)	6	1986	1,498	250	Westslope cutthroat	
			1988	1,500	250	Westslope cutthroat	
			1990	1,500	250	Westslope cutthroat	
			1992	1,500	250	Westslope cutthroat	
			1994	1,000	167	Westslope cutthroat	
			1996	1,511	252	Westslope cutthroat	
	Little Ball Creek (1-127)	4	1984	1,500	375	Westslope cutthroat	
			1986	956	239	Westslope cutthroat	
			1988	1,000	250	Westslope cutthroat	
			1990	1,000	250	Westslope cutthroat	
			1992	1,000	250	Westslope cutthroat	
			1994	1,500	375	Westslope cutthroat	
			1996	1,003	251	Westslope cutthroat	
	Snow (1-134)	10	1987	2,500	250	Westslope cutthroat	
			1989	2,400	240	Westslope cutthroat	
			1991	2,500	250	Westslope cutthroat	
			1993	2,500	250	Westslope cutthroat	
			1995	2,500	250	Westslope cutthroat	
	Roman Nose #1 (1-135)	16	1993	390	24	Bull trout	(brook trout control)
	Roman Nose #2 (1-136)	7.9	1993	162	21	Bull trout	(brook trout
			1996	3,077	389	Westslope cutthroat	(control)
	Roman Nose #3 (1-136)	12	1986	3,000	250	Westslope cutthroat	
			1987	3,000	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai							
	Roman Nose (cont'd)		1988	3,000	250	Westslope cutthroat	
			1989	3,000	250	Kamloops rainbow	
			1990	1,000	83	Westslope cutthroat	(size 2)
			1991	3,150	262	Kamloops rainbow	
			1992	1,305	109	Westslope cutthroat	(size 2)
			1993	3,000	250	Kamloops rainbow	
			1994	3,772	314	Westslope cutthroat	772 were size 2
			1995	3,000	250	Westslope cutthroat	(size 1)
			1996	3,002	250	Westslope cutthroat	
	Queen (1-148)	5	1986	1,250	250	Westslope cutthroat	
			1988	1,250	250	Westslope cutthroat	
			1990	1,250	250	Westslope cutthroat	
			1992	1,250	250	Westslope cutthroat	
			1996	1,265	253	Westslope cutthroat	
	Debt (1-150)	5	1985	1,250	250	Westslope cutthroat	
			1989	1,250	250	Westslope cutthroat	
			1991	1,250	250	Westslope cutthroat	
			1993	1,250	250	Westslope cutthroat	
			1995	1,250	250	Westslope cutthroat	
	Spruce (1-154)	5	1986	1,250	250	Westslope cutthroat	
			1987	1,250	250	Westslope cutthroat	
			1988	1,250	250	Westslope cutthroat	
			1989	1,265	253	Westslope cutthroat	
			1990	1,250	250	Westslope cutthroat	
			1991	1,247	250	Kamloops rainbow	
			1992	1,250	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Kootenai							
	Spruce (cont'd)		1993	1,250	250	Kamloops rainbow	
			1994	1,360	272	Westslope cutthroat	
			1995	1,269	254	Westslope cutthroat	
			1996	1,265	254	Westslope cutthroat	
	Copper (1-155)	5	1986	1,250	250	Westslope cutthroat	
			1988	1,247	250	Westslope cutthroat	
			1990	1,250	250	Westslope cutthroat	
			1992	1,250	250	Westslope cutthroat	
			1994	1,360	273	Westslope cutthroat	
			1996	1,265	253	Westslope cutthroat	
	Callahan (1-160; Smith)	10	1984	2,500	250	Westslope cutthroat	
			1987	2,522	252	Westslope cutthroat	
			1988	2,500	250	Westslope cutthroat	
			1992	2,563	251	Westslope cutthroat	
			1993	2,514	250	Westslope cutthroat	
			1995	2,500	250	Westslope cutthroat	
	Estelle (1-167)	5	1988	1,075	215	Brown trout	Test control of stunted brook trout
			1990	500	100	Brown trout (size 3)	
			1992	150	30	Brown trout (size 2)	
Pend Oreille							
	Hunt (2-101)	12	1982	3,648	304	Kamloops rainbow	
			1985	3,000	250	Westslope cutthroat	
			1986	3,000	250	Westslope cutthroat	
			1987	3,033	253	Westslope cutthroat	
			1988	3,000	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Pend Oreille							
	Hunt (cont'd)		1989	5,000	417	Westslope cutthroat	
			1990	3,000	250	Westslope cutthroat	
			1991	3,000	250	Westslope cutthroat	
			1992	3,023	252	Westslope cutthroat	
			1993	3,000	250	Westslope cutthroat	
			1994	3,000	250	Westslope cutthroat	
			1995	3,020	252	Westslope cutthroat	
			1996	2,993	249	Westslope cutthroat	
	Standard (2-103)	16	1983	4,021	251	Henrys Lake cutthroat	
			1985	4,000	250	Westslope cutthroat	
			1987	3,962	248	Westslope cutthroat	
			1989	4,000	250	Westslope cutthroat	
			1991	4,000	250	Westslope cutthroat	
			1993	4,020	251	Westslope cutthroat	
			1995	4,000	250	Westslope cutthroat	
	Two Mouth # 1	?				Discontinued stocking due to winter kill in 1981	
	Two Mouth # 2 (2-107)	5	1987	1,269	254	Westslope cutthroat	
			1989	1,265	253	Westslope cutthroat	
			1991	1,250	250	Westslope cutthroat	
			1993	1,327	265	Westslope cutthroat	
			1995	1,250	250	Westslope cutthroat	
	Two Mouth # 3 (2-108)	20	1986	5,000	250	Westslope cutthroat	
			1988	5,000	250	Westslope cutthroat	
			1990	5,000	250	Westslope cutthroat	
			1992	5,000	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Pend Oreille							
	Two Mouth # 3 (cont'd)		1994	5,000	250	Westslope cutthroat	
			1996	5,002	250	Westslope cutthroat	
	Mollies (2-114)	2	1987	508	254	Westslope cutthroat	
			1989	500	250	Westslope cutthroat	
			1991	500	250	Westslope cutthroat	
			1993	503	251	Westslope cutthroat	
	Caribou (2-116)	6.8	1984	1,752	258	Henrys Lake cutthroat	(near West Fk. Mtn)
			1986	1,750	257	Westslope cutthroat	
			1987	1,750	257	Westslope cutthroat	
			1988	1,750	257	Westslope cutthroat	
			1990	1,750	257	Westslope cutthroat	
			1992	1,750	257	Westslope cutthroat	
			1994	1,750	257	Westslope cutthroat	
			1996	3,050	449	Westslope cutthroat	
	Fault (2-121; Hunt Peak #1)	6	1987	1,500	250	Westslope cutthroat	
			1989	1,553	259	Westslope cutthroat	
			1991	2,275	379	Westslope cutthroat	Received McCormick Lake fish as well.
			1993	1,500	250	Westslope cutthroat	
			1995	1,500	250	Westslope cutthroat	
	McCormick (2-122; Hunt Peak #2)	3.1	1985	780	252	Westslope cutthroat	
			1987	775	250	Westslope cutthroat	
			1989	805	260	Westslope cutthroat	
			1991	816	263	Westslope cutthroat	
			1993	775	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Pend Oreille							
	Little Harrison (2-126)	6.5	1983	1,651	254	Henrys Lake cutthroat	
			1987	1,625	250	Westslope cutthroat	
			1988	1,625	250	Westslope cutthroat	
			1990	1,625	250	Westslope cutthroat	
			1992	1,625	250	Westslope cutthroat	
			1994	1,625	250	Westslope cutthroat	
			1996	1,621	250	Westslope cutthroat	
	Beehive (2-128)	7	1986	1,803	258	Westslope cutthroat	
			1987	1,750	250	Westslope cutthroat	
			1989	2,164	309	Westslope cutthroat	
			1991	1,750	250	Westslope cutthroat	
			1993	1,750	250	Westslope cutthroat	
	Harrison (2-129)	29	1986	6,870	237	Westslope cutthroat	
			1987	7,264	250	Westslope cutthroat	
			1988	7,250	250	Westslope cutthroat	
			1989	7,479	258	Westslope cutthroat	
			1990	7,250	250	Westslope cutthroat	
			1991	7,246	250	Westslope cutthroat	
			1992	7,250	250	Westslope cutthroat	
			1993	7,250	250	Westslope cutthroat	
			1994	7,250	250	Westslope cutthroat	
			1995	7,266	250	Westslope cutthroat	
			1996	7,273	250	Westslope cutthroat	
	Beaver (2-130)	5	1990	500	100	Brown trout (size 3)	Test control of stunted brook trout
			1992	150	30	Brown trout (size 2)	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Pend Oreille							
	Dennick (2-171)	8	1986	2,500	312	Westslope cutthroat	
			1987	2,000	250	Westslope cutthroat	
			1988	2,000	250	Westslope cutthroat	
			1989	2,064	258	Westslope cutthroat	
			1990	2,000	250	Westslope cutthroat	
			1991	2,000	250	Westslope cutthroat	
			1992	2,000	250	Westslope cutthroat	
			1992	150	19	Brown trout	Stocked by mistake (helicopter plant)
			1993	2,053	257	Westslope cutthroat	
			1994	2,000	250	Westslope cutthroat	
			1995	2,000	250	Westslope cutthroat	
			1996	2,012	250	Westslope cutthroat	
	Sand (2-172)	5	1986	1,250	250	Westslope cutthroat	
			1987	1,250	250	Westslope cutthroat	
			1988	1,247	250	Westslope cutthroat	
			1989	1,250	250	Westslope cutthroat	
			1990	1,250	250	Westslope cutthroat	
			1991	1,250	250	Westslope cutthroat	
			1992	1,250	250	Westslope cutthroat	
			1993	1,026	205	Westslope cutthroat	
			1994	1,250	250	Westslope cutthroat	
			1995	1,250	250	Westslope cutthroat	
			1996	1,275	255	Westslope cutthroat	
	Porcupine (2-182)	13	1986	1,075	83	Mt. Lassen rainbow	
			1987	--	--		Road washed out
			1988	600	46	Mt. Lassen rainbow	
			1989	690	53	Mt. Lassen rainbow	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Pend Oreille							
	Porcupine (cont'd)		1990	750	58	Catchable rainbow	
			1991	--	--	Not stocked	Road washed out
			1993	387	30	Kamloops rainbow	
			1994	303	23	Hayspur rainbow	
	Moose (2-185)	16.5	1987	1,000	61	Brown trout	Test control on
			1988	4,515	274	Brown trout	stunted brook trout
			1990	500	30	Brown trout	(size 3)
			1992	500	30	Brown trout	(size 2)
	Antelope (2-190)	16	1982	5,032	314	Westslope cutthroat	
			1989	1,155	72	Mt. Lassen rainbow	(size 3)
			1990	1,000	63	Catchable rainbow	
			1990	200	12	Westslope cutthroat	(Broodstock)
			1991	2,000	125	Westslope cutthroat	(size 2)
			1991	1,100	69	Eagle Lake rainbow	(size 3)
			1991	50	3	Creston brdstck rainbow	(Eagle Lake)
			1992	1,363	85	Hayspur rainbow	(size 3)
			1993	1,387	87	Hayspur rainbow	(size 3)
			1994	1,000	62	Hayspur rainbow	(Size 3)
	Caribou (2-196; near Keokee Mtn.)	6.8	1986	1,500	220	Westslope cutthroat	
			1987	1,704	250	Westslope cutthroat	
			1988	1,722	253	Westslope cutthroat	
			1989	1,700	250	Westslope cutthroat	
			1990	1,700	250	Westslope cutthroat	
			1991	1,700	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Spokane							
	Caribou (cont'd)		1992	1,750	257	Westslope cutthroat	
			1993	1,700	250	Westslope cutthroat	
			1994	1,700	250	Westslope cutthroat	
			1996	1,700	250	Westslope cutthroat	
	Elsie (3-119)	10	1986	3,024	302	Catchable rainbow	
			1987	2,000	200	Hayspur rainbow	
			1988	4,050	405	Hayspur rainbow	
			1989	2,856	284	Mt. Lassen rainbow	
			1990	3,000	300	Eagle Lake	
			1991	3,516	350	Hayspur rainbow	
			1992	4,020	402	Hayspur rainbow	
			1993	4,045	404	Hayspur rainbow	
			1994	2,264	226	Hayspur rainbow	
	Lower Glidden (3-123)	12	1986	3,011	251	Catchable rainbow	
			1987	3,277	273	Hayspur rainbow	
			1988	3,001	250	Hayspur rainbow	
			1989	2,836	236	Mr. Lassen rainbow	
			1990	1,775	148	Catchable rainbow	
			1991	1,986	165	Hayspur rainbow	(size 3)
			1992	3,534	295	Hayspur rainbow	
			1993	4,005	334	Hayspur rainbow	
			1994	2,212	184	Hayspur rainbow	
	Upper Glidden (3-124)	10	1980	992	99	Kamloops rainbow	
			1993	180	18	Bull trout	Brook trout control

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Spokane							
	Gold	3	1983	1,005	335	Henrys Lk cutthroat	Shallow, need to
	(3-125)		1987	750	250	Westslope cutthroat	evaluate survival
			1989	750	250	Westslope cutthroat	
			1991	750	250	Mt. Lassen rainbow	
			1993	500	167	Kamloops rainbow	
	Revett	12	1980	992	83	Kamloops rainbow	
	(3-130)		1993	309	26	Bull trout	Brook trout control
	Crater	5	1983	5,000	1,000	Grayling	Reserve for
	(3-133)		1987	2,100	420	Grayling	grayling.
			1988	2,500	500	Grayling	
			1990	2,500	500	Grayling	
			1991	2,500	500	Grayling	
			1993	2,500	500	Grayling	
			1995	1,750	340	Grayling	
			1996	3,105	621	Grayling	
	Dismal	?	1987	249	--	Hayspur rainbow	
	(3-138)		1988	260	--	Mt. Lassen rainbow	
			1988	260	--	Hayspur rainbow	
			1989	225	--	Mr. Lassen rainbow	
			1990	250	--	Catchable rainbow	
			1991	243	--	Hayspur rainbow	
			1992	250	--	Hayspur rainbow	
			1993	230	--	Hayspur rainbow	
			1994	265	--	Hayspur rainbow	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
Spokane							
	Bacon (3-144)	9	1985	2,255	250	Westslope cutthroat	
			1987	2,250	250	Westslope cutthroat	
			1989	2,250	250	Westslope cutthroat	
			1991	2,250	250	Westslope cutthroat	
			1993	2,250	250	Westslope cutthroat	
			1995	2,320	258	Westslope cutthroat	
	Forage (3-146)	13	1987	3,150	242	Golden trout	Reserve for golden trout or grayling.
			1988	3,250	250	Grayling	
			1989	2,000	154	Grayling	
			1990	3,250	250	Golden trout	
			1992	600	46	Grayling	
			1993	3,250	250	Grayling	
			1995	670	52	Grayling	
			1996	3,250	250	Grayling	
	Halo (3-147)	12	1985	3,010	251	Westslope cutthroat	
			1987	3,000	250	Westslope cutthroat	
			1989	3,000	250	Westslope cutthroat	
			1991	3,000	250	Westslope cutthroat	
			1993	3,000	250	Westslope cutthroat	
			1995	3,118	260	Westslope cutthroat	
	Crystal (3-160)	10	1987	2,510	251	Westslope cutthroat	
			1988	2,500	250	Westslope cutthroat	
			1989	2,500	250	Westslope cutthroat	
			1991	2,500	250	Westslope cutthroat	
			1993	2,500	250	Westslope cutthroat	
			1995	2,520	250	Westslope cutthroat	

Appendix C Continued.

Drainage Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
LNF Clearwater						
Devils Club	4	1986	1,000	250	Westslope cutthroat	
(6-113)		1988	1,000	250	Westslope cutthroat	
		1991	1,093	273	Westslope cutthroat	
		1992	1,000	250	Westslope cutthroat	
		1996	1,000	250	Westslope cutthroat	
LNF Clearwater						
Big Talk	?	1986	1,500	--	Westslope cutthroat	
(6-114)		1988	2,500	--	Westslope cutthroat	
		1990	2,737	--	Westslope cutthroat	
		1992	2,500	--	Westslope cutthroat	
		1996	2,500	--	Westslope cutthroat	
Larkins	12	1986	3,000	250	Westslope cutthroat	
(6-117)		1988	3,000	250	Westslope cutthroat	
		1990	3,278	273	Westslope cutthroat	
		1996	3,000	250	Westslope cutthroat	
Mud	6	1987	1,500	250	Westslope cutthroat	
(6-118)		1989	1,500	250	Westslope cutthroat	
		1991	1,500	250	Mt. Lassen rainbow	
		1993	1,500	250	Hayspur rainbow	
		1995	1,500	250	Trout Lake rainbow	
Hero	4	1986	1,000	250	Westslope cutthroat	
(6-119)		1988	1,000	250	Westslope cutthroat	
		1990	1,093	273	Westslope cutthroat	
		1992	1,000	250	Westslope cutthroat	
		1996	1,000	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
LNF Clearwater							
	Heart (6-122)	40	1986	10,000	250	Westslope cutthroat	
			1990	10,000	250	Mt. Lassen rainbow	
			1992	10,000	250	Mt. Lassen rainbow	
			1994	3,865	97	Kamloops rainbow	
			1996	10,006	250	Kamloops rainbow	
	Northbound (6-123)	12	1986	3,000	250	Westslope cutthroat	
			1988	3,000	250	Westslope cutthroat	
			1990	3,278	273	Westslope cutthroat	
			1992	3,000	250	Westslope cutthroat	
			1994	500	42	Westslope cutthroat	
			1996	3,000	250	Westslope cutthroat	
	Skyland (6-125)	13	1987	3,250	250	Westslope cutthroat	
			1989	3,250	250	Westslope cutthroat	
			1991	3,250	250	Mt. Lassen rainbow	
			1993	3,250	250	Hayspur rainbow	
			1995	3,250	250	Trout Lake rainbow	
	Fawn (6-126)	13	1986	3,250	250	Westslope cutthroat	
			1988	3,250	250	Westslope cutthroat	
			1990	3,565	274	Westslope cutthroat	
			1992	3,250	250	Westslope cutthroat	
			1996	3,250	250	Westslope cutthroat	
	Noseeum (6-130)	4	1985	1,008	252	Westslope cutthroat	
			1987	1,000	250	Westslope cutthroat	
			1989	1,000	250	Westslope cutthroat	
			1991	1,000	250	Westslope cutthroat	

Appendix C Continued.

Drainage	Lake	Surface acres	Year stocked	Number stocked	Stocking rate (fish/acre)	Stock of fish	Comments
LNF Clearwater							
	Noseeum (cont'd)		1993	1,000	250	Westslope cutthroat	
			1995	1,007	252	Westslope cutthroat	
	Steamboat (6-131)	9	1986	2,000	222	Grayling	Reserve for grayling.
			1988	4,500	500	Grayling	
			1989	2,000	222	Grayling	
			1990	4,500	500	Grayling	
			1991	3,500	389	Grayling	
			1992	650	72	Grayling	
			1993	4,500	500	Grayling	
			1995	3,000	333	Grayling	
			1996	5,135	571	Grayling	

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